Cisco Enterprise Network Compute System Switch Command Reference

First Published: 2017-10-06

Last Modified: 2019-08-07

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
http://www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883

CONTENTS

802.1X Commands

dot1x authentication default

Note The documentation set for this product strives to use bias-free language. For purposes of this documentation set, bias-free is defined as language that does not imply discrimination based on age, disability, gender, racial identity, ethnic identity, sexual orientation, socioeconomic status, and intersectionality. Exceptions may be present in the documentation due to language that is hardcoded in the user interfaces of the product software, language used based on standards documentation, or language that is used by a referenced third-party product.

To specify the authentication mode for 802.1X authentication, use the **dot1x authentication default** command in switch configuration mode. To restore the default configuration, use the **no** form of this command.

dot1x authentication default { **none** | **radius** }

no dot1x authentication default

Syntax Description

none	Uses no authentication
radius	Uses the list of all RADIUS servers for authentication

Command Default

RADIUS server

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

None

Example

The following example sets the 802.1X authentication mode to RADIUS server authentication:

```
nfvis(config-switch)# dot1x authentication default radius
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

dot1x guest-vlan timeout

To set the time delay between enabling 802.1X (or port up) and adding a port to the guest VLAN, use the **dot1x guest-vlan timeout** command in switch configuration mode. To restore the default configuration, use the **no** form of this command.

dot1x guest-vlan timeout *timeout time*
no dot1x guest-vlan timeout

Syntax Description

timeout time	Specifies the time delay in seconds between enabling 802.1X (or port up) and adding the port to the guest VLAN. Valid range is from 30–180.

Command Default

The guest VLAN is applied immediately.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

This command is relevant if the guest VLAN is enabled on the port.

Example

The following example sets a delay of 90 seconds between enabling 802.1X and adding a port to a guest VLAN:

```
nfvis(config-switch)# dot1x guest-vlan timeout 90
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

dot1x system-auth-control

To enable 802.1X globally, use the **dot1x system-auth-control** command in switch configuration mode. To restore the default configuration, use the **no** form of this command.

dot1x system-auth-control
no dot1x system-auth-control

Syntax Description

This command has no arguments or keywords

Command Default

Disabled

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The code in the example enables 802.1X globally

```
nfvis(config-switch)# dot1x system-auth-control
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

authentication open

To enable open access (monitoring mode) on this port, use the **authentication open** command in interface switch configuration mode. To disable open access on this port, use the **no** form of this command.

authentication open
no authentication open

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Interface switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

Open access or monitoring mode allows clients or devices to gain network access before authentication is performed. In this mode, the switch processes failure replies that are received from a Radius server as success.

Example

The following example shows how to enable open access (monitoring mode) on the Gigabit Ethernet interface 1/0:

```
nfvis(config-switch)# interface gigabitEthernet 1/0
nfvis(config-switch-if)# authentication open
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

dot1x authentication

To enable authentication methods on a port, use the **dot1x authentication** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

dot1x authentication {**802.1x** | **mac** | **both**}

no dot1x authentication

Syntax Description

802.1x	Enables authentication based on 802.1X (802.1X-based authentication).
mac	Enables authentication based on the station's MAC address (MAC-based authentication).
both	Enables both 802.1X-based authentication and MAC-based authentication.

Command Default

802.1X-based authentication is enabled.

Command Modes

Interface (Gigabit Ethernet) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

Static MAC addresses cannot be authorized by the MAC-based method. Do not change a dynamic MAC address to a static one or delete it if the MAC address was authorized by the MAC-based authentication:

- If a dynamic MAC address that is authenticated by MAC-based authentication is changed to a static MAC address, it is not manually re-authenticated.
- Removing a dynamic MAC address authenticated by the MAC-based authentication causes its re-authentication.

Example

The following example enables authentication based on 802.1x and the station’s MAC address on the Gigabit Ethernet 1/0 interface:

```
nfvis(config-switch)# interface gigabitEthernet 1/0
nfvis(config-switch-if)# dot1x authentication both
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

dot1x guest-vlan enable

To enable unauthorized users on the access interface to the guest VLAN, use the **dot1x guest-vlan enable** command in interface switch configuration mode. To disable access, use the **no** form of this command.

dot1x guest-vlan enable

no dot1x guest-vlan enable

Syntax Description

This command has no arguments or keywords.

Command Default

By default, this configuration is disabled.

Command Modes

Interface (Gigabit Ethernet) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

This command cannot be configured if the monitoring VLAN is enabled on the interface. If the port does not belong to the guest VLAN, it is added to the guest VLAN as an egress untagged port.

If 802.1X is disabled, the port static configuration is reset.

Example

The following example enables unauthorized users on the Gigabit Ethernet 1/1 interface to access the guest VLAN:

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# dot1x guest-vlan enable
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

dot1x guest-vlan

To define a guest VLAN, use the **dot1x guest-vlan** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

dot1x guest-vlan

no dot1x guest-vlan

Syntax Description

This command has no arguments or keywords

Command Default

No VLAN is defined as a guest VLAN.

Command Modes

Interface (VLAN) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

- Use the **dot1x guest-vlan enable** command to enable unauthorized users on an interface to access the guest VLAN.
- A device can have only one global guest VLAN.
- The guest VLAN must be a static VLAN, and it cannot be removed.
- An unauthorized VLAN cannot be configured as guest VLAN.

Example

The following example shows how to define a guest VLAN:

```
nfvis(config-switch)# interface vlan 2
nfvis(config-switch-if)# dot1x guest-vlan
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

dot1x host-mode

To allow a single host (client) or multiple hosts on an IEEE 802.1X-authorized port, use the **dot1x host-mode** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

dot1x host-mode {**multi-host** | **single-host**}

Syntax Description

multi-host	Enables multi-hosts mode.
single-host	Enables single-host mode.

Command Default

The default mode is multi-host mode.

Command Modes

Interface (Gigabit Ethernet) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

Single-Host Mode

The single-host mode manages the authentication status of the port. The port is authorized if there is an authorized host. In this mode, only a single host can be authorized on the port.

When a port is unauthorized, and the guest VLAN is enabled, untagged traffic is remapped to the guest VLAN. Tagged traffic is dropped unless the VLAN tag is the guest VLAN or the unauthenticated VLANs. If guest VLAN is not enabled on the port, only tagged traffic belonging to the unauthenticated VLANs is bridged.

When a port is authorized, untagged and tagged traffic from the authorized host is bridged based on the static VLAN membership configured on the port. Traffic from the other hosts is dropped.

The switch removes from FDB all MAC addresses learned on a port when its authentication status is changed from authorized to unauthorized.

Multi-Host Mode

The multi-host mode manages the authentication status of the port. The port is authorized after at least one host is authorized.

When a port is unauthorized, and the guest VLAN is enabled, untagged traffic is remapped to the guest VLAN. Tagged traffic is dropped unless the VLAN tag is the guest VLAN or the unauthenticated VLANs. If guest VLAN is not enabled on the port, only tagged traffic belonging to the unauthenticated VLANs is bridged.

When a port is authorized, untagged and tagged traffic from all hosts connected to the port is bridged based on the static VLAN membership configured at the port.

The switch removes from FDB all MAC addresses learned on a port when its authentication status is changed from authorized to unauthorized.

Example

The following example enables multi-host on the Gigabit Ethernet 1/1 interface:

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# dot1x host-mode multi-host
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

dot1x max-eap-req

To set the maximum number of times the device sends an Extensible Authentication Protocol (EAP) request/identity frame (assuming that no response is received) to the client before restarting the authentication process, use the **dot1x max-eap-req** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

dot1x max-eap-req *count*
no dot1x max-eap-req

Syntax Description

count	Specifies the maximum number of times that the device sends an EAP request/identity frame before restarting the authentication process. Valid range is from 1 to 10.

Command Default

The default maximum number of attempts is 2.

Command Modes

Interface (Gigabit Ethernet) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The code in the example sets the maximum number of times the device sends an EAP request/identity frame to 6.

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# dot1x max-eap-req 6
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

dot1x port-control

To enable manual control of the port authorization state, use the **dot1x port-control** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

dot1x port-control {**auto** | **force-authorized** | **force-unauthorized**}

Syntax Description

auto	Enables 802.1X authentication on the port and causes it to transition to the authorized or unauthorized state, based on the 802.1X authentication exchange between the device and the client.
force-authorized	Disables 802.1X authentication on the interface and causes the port to transition to the authorized state without any authentication exchange required. The port sends and receives traffic without 802.1X-based client authentication.
force-unauthorized	Denies all access through this port by forcing it to transition to the unauthorized state and ignoring all attempts by the client to authenticate. The device cannot provide authentication services to the client through this port.

Command Default

The port is in the force-authorized state.

Command Modes

Interface (Gigabit Ethernet) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

The switch removes all MAC addresses learned on a port when its authorization control is changed from force-authorized to another.

Note To proceed to the forwarding state immediately after successful authentication, we recommend to disable spanning tree or enable spanning-tree PortFast mode on 802.1X edge ports in the **auto** state that are connected to end stations.

Example

The following example sets 802.1X authentication on Gigabit Ethernet interface 1/1 to the auto mode:

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# dot1x port-control auto
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

dot1x reauthentication

To enable periodic re-authentication of the client, use the **dot1x reauthentication** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

dot1x reauthentication
no dot1x reauthentication

Syntax Description

This command has no arguments or keywords

Command Default

Periodic re-authentication is disabled.

Command Modes

Interface (Gigabit Ethernet) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The code in the example enables periodic re-authentication of the client.

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# dot1x reauthentication
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

dot1x timeout quiet-period

To set the time interval that the device remains in a quiet state following a failed authentication exchange, use the **dot1x timeout quiet-period** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

dot1x timeout quiet-period *seconds*
no dot1x timeout quiet-period

Syntax Description

seconds	Specifies the time interval in seconds that the device remains in a quiet state following a failed authentication exchange with a client. Valid range is from 10 to 65535 seconds.

Command Default

The default quiet period is 60 seconds.

Command Modes

Interface (Gigabit Ethernet) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

During the quiet period, the device does not accept or initiate authentication requests.

The default value of this command should only be changed to adjust to unusual circumstances, such as unreliable links or specific behavioral problems with certain clients and authentication servers. To provide faster response time to the user, a smaller number than the default value should be entered.

For 802.1x and MAC-based authentication, the number of failed logins is 1. For 802.1x-based and MAC-based authentication methods, the quite period is applied after each failed attempt.

Example

The following example sets the time interval during which the device remains in the quiet state following a failed authentication exchange to 120 seconds.

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# dot1x timeout quiet-period 120
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

dot1x timeout reauth-period

To set the number of seconds between re-authentication attempts, use the **dot1x timeout reauth-period** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

dot1x timeout reauth-period *seconds*
no dot1x timeout reauth-period

Syntax Description

reauth-period seconds	Number of seconds between re-authentication attempts. Valid range is from 300—4294967295.

Command Default

3600

Command Modes

Interface (Gigabit Ethernet) switch configuration (config-switch-if)

Usage Guidelines

The command is applied only to the 802.1x authentication method.

Command History

Release	Modification
3.5.1	This command was introduced.

Example

```
nfvis(config-switch)# interface gigabitEthernet 1/0
nfvis(config-switch-if)# dot1x timeout reauth-period 5000
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

dot1x timeout server-timeout

To set the time interval during which the device waits for a response from the authentication server, use the **dot1x timeout server-timeout** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

dot1x timeout server-timeout *seconds*
no dot1x timeout server-timeout

Syntax Description

server-timeout seconds	Specifies the time interval in seconds during which the device waits for a response from the authentication server. Valid range is from 1 to 65535 seconds.

Command Default

The default timeout period is 30 seconds.

Command Modes

Interface (Gigabit Ethernet) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

The actual timeout period can be determined by comparing the value specified by this command to the result of multiplying the number of retries specified by the radius-server retransmit command with the timeout period specified by the radius-server retransmit command, and selecting the lower of the two values.

Example

The code in the example sets the time interval between retransmission of packets to the authentication server to 3600 seconds.

```
nfvis(config-switch)# interface gigabitEthernet 1/0
nfvis(config-switch-if)# dot1x timeout server-timeout 3600
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

dot1x timeout supp-timeout

To set the time interval during which the device waits for a response to an Extensible Authentication Protocol (EAP) request frame from the client before resending the request, use the **dot1x timeout supp-timeout** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

dot1x timeout supp-timeout *seconds*
no dot1x timeout supp-timeout

Syntax Description

seconds	Specifies the time interval in seconds during which the device waits for a response to an EAP request frame from the client before resending the request. Valid range is from 1 to 65535 seconds.

Command Default

The default timeout period is 30 seconds

Command Modes

Interface (Gigabit Ethernet) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

The default value of this command should be changed only to adjust to unusual circumstances, such as unreliable links or specific behavioral problems with certain clients and authentication servers.

The command is only applied to the 802.1x authentication method.

Example

The following example sets the time interval, during which the device waits for a response to an EAP request frame from the client before resending the request, to 3600 seconds.

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# dot1x timeout supp-timeout 3600
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

dot1x timeout tx-period

To set the time interval during which the device waits for a response to an Extensible Authentication Protocol (EAP) request/identity frame from the client before resending the request, use the **dot1x timeout tx-period** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

dot1x timeout tx-period *seconds*
nodot1x timeout tx-period

Syntax Description

seconds	Specifies the time interval in seconds during which the device waits for a response to an EAP-request/identity frame from the client before resending the request. (Range: 30 to 65535 seconds).

Command Default

The default timeout period is 30 seconds.

Command Modes

Interface (Gigabit Ethernet) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

The default value of this command should be changed only to adjust to unusual circumstances, such as unreliable links or specific behavioral problems with certain clients and authentication servers.

The command is only applied to the 802.1x authentication method.

Example

The following example sets the time interval, during which the device waits for a response to an EAP request/identity frame, to 60 seconds.

```
nfvis(config-switch)# interface gigabitEthernet 1/0
nfvis(config-switch-if)# dot1x timeout tx-period 60
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

dot1x violation mode

To configure the action to be taken when an unauthorized host on an authorized port in single-host mode attempts to access the interface, use the **dot1x violation-mode** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

dot1x violation-mode {**restrict** | **protect** | **shutdown**}
no dot1x violation-mode

Syntax Description

restrict	Generates a trap when a station, whose MAC address is not the supplicant MAC address, attempts to access the interface. The minimum time between the traps is 1 second. Those frames are forwarded but their source addresses are not learned.
protect	Discard frames with source addresses that are not the supplicant address.
shutdown	Discard frames with source addresses that are not the supplicant address and shutdown the port.

Command Default

Protect

Command Modes

Interface (Gigabit Ethernet) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

The command is relevant only for the single-host mode.

BPDU messages, whose MAC addresses are not the supplicant MAC address, are not discarded in the Protect mode.

BPDU messages, whose MAC addresses are not the supplicant MAC address, cause a shutdown in the Shutdown mode.

Example

The following example sets the interface to the protect mode.

```
nfvis(config-switch)# interface gigabitEthernet 1/0
nfvis(config-switch-if)# dot1x violation-mode protect
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

show switch dot1x

To display information about 802.1X interfaces, use the **show switch dot1x** command in privileged EXEC mode.

switch show dot1x [**interface gigabitEthernet** *interface-id* | **statistics** | **summary** | **users**]

Syntax Description

interface gigabitEthernet *interface-id*	Displays the information for the specified interface ID.
statistics	Displays 802.1x statistics.
summary	Displays interface summary.
users	Displays information about authenticated users.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following is a sample output of the **show switch dot1x** command for Gigabit Ethernet interface 1/0:

```
nfvis# show switch dot1x interface gigabitEthernet 1/0
dot1x interface gigabitEthernet 1/0
 host-mode                multiple
 port-admin-status        force-authorized
 guest-vlan               "Guest VLAN: disabled"
 open-access              "Open access: disabled"
 server-timeout           30
 port-oper-status         "Port Operational Status: authorized*"
 reauthentication         "Reauthenticaion is disabled"
 reauthentication-timeout 3600
 quiet-period             60
 auth-tx-period           30
 auth-supplicant-timeout  30
 max-req                  2
 auth-failure-count       0
 auth-success-count       0
```

Address Table Commands

bridge multicast filtering

To enable the filtering of multicast addresses, use the **bridge multicast filtering** command in switch configuration mode. To disable multicast address filtering, use the **no** form of this command.

bridge multicast filtering
no bridge multicast filtering

Syntax Description

This command has no arguments or keywords.

Command Default

Multicast address filtering is disabled. All multicast addresses are flooded to all ports.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

When this feature is enabled, unregistered multicast traffic (as opposed to registered) are still flooded. All registered multicast addresses are forwarded to the multicast groups.

Example

The following example enables bridge multicast filtering:

```
nfvis(config-switch)# bridge multicast filtering
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

bridge multicast unregistered

To configure the forwarding or filtering of unregistered multicast addresses, use the **bridge multicast unregistered** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

bridge multicast unregistered {**forwarding** | **filtering**}
no bridge multicast unregistered

Syntax Description

forwarding	Forwards unregistered multicast packets.
filtering	Filters unregistered multicast packets.

Command Default

Unregistered multicast packets are forwarded.

Command Modes

Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

Do not enable unregistered multicast filtering on ports that are connected to routers because the 224.0.0.x address range should not be filtered. Routers do not necessarily send IGMP reports for the 224.0.0.x range. You can run this command before the VLAN is created.

Example

The following example specifies that unregistered multicast packets are filtered on port channel 1:

```
nfvis(config-switch)# interface port-channel 1
nfvis(config-switch-if)# bridge multicast unregistered filtering
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

bridge unicast unknown

To enable egress filtering of unicast packets where the destination MAC address is unknown to the device, use the **bridge unicast unknown** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

bridge unicast unknown {**forwarding** | **filtering**}
no bridge unicast unknown

Syntax Description

forwarding	Forwards the unicast packets with unknown destination MAC address.
filtering	Filters the unicast packets with unknown destination MAC address.

Command Default

Unicast packets with unknown destination MAC address are forwarded.

Command Modes

Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example filters the unicast packets on Gigabit Ethernet interface 1/1 when the destination is unknown:

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# bridge unicast unknown filtering
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

mac address-table aging-time

To set the aging time of the address table, use the **mac address-table aging-time** command in switch configuration mode. To restore the default, use the **no** form of this command.

mac address-table aging-time *seconds*
no mac address-table aging-time

Syntax Description

seconds	Time in seconds. Valid range is from 10 to 630 seconds.

Command Default

300

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example sets the aging time of the address table to 600 seconds:

```
nfvis(config-switch)# mac address-table aging-time 600
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

mac address-table static

To add a MAC-layer station source address to the MAC address table for a Gigabit Ethernet or port channel interface, use the **mac address-table static** command in switch configuration mode. To delete the MAC address, use the **no** form of this command.

mac address-table static *mac-address* **vlan** *vlan-id* **interface** {**gigabitEthernet** | **port-channel**} *interface-id* {**permanent** | **delete-on-reset** | **delete-on-timeout**}
no mac address-table static *mac-address* **vlan** *vlan-id*

Syntax Description

mac-address	Specify a valid MAC address.
vlan *vlan-id*	Specify the VLAN ID.
interface	Specifies the interface type.
gigabitEthernet	Specifies Gigabit Ethernet as the interface type.
port-channel	Specifies port channel as the interface type.
interface-id	Specify an interface ID.
permanent	Specifies the permanent static MAC address. The keyword is applied by the default.
delete-on-reset	Specifies the delete-on-reset static MAC address.
delete-on-timeout	Specifies the delete-on-timeout static MAC address.

Command Default

No static addresses are defined. The default mode for an added address is permanent.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.6.1	The port-channel parameter was added.
3.5.1	This command was introduced.

Usage Guidelines

Use the command to add a static MAC address with a given time-to-live.

Each MAC address in the MAC address table is assigned two attributes: **type** and **time-to-live**.

The following value of time-to-live is supported:

- **permanent**: MAC address is saved until it is removed manually.
- **delete-on-reset**: MAC address is saved until the next reboot.
- **delete-on-timeout**: MAC address may be removed by the aging timer.

The following types are supported:

- **static**: a MAC address manually added by the command with the following keywords that specify its time-to-live: **permanent**, **delete-on-reset**, **delete-on-timeout**.

  A static MAC address may be added in any port mode.

- **dynamic**: a MAC address learned by the switch in a non-secure mode. The value of its **time-to-live** attribute is **delete-on-timeout**.

Example 1

The following example adds a permanent static MAC address:

```
nfvis(config-switch)# mac address-table static 00:3f:bd:45:5a:b1 vlan 1 interface
gigabitEthernet 1/1 permanent
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

Example 2

The following example adds a deleted-on-reset static MAC address:

```
nfvis(config-switch)# mac address-table static 00:3f:bd:45:5a:b1 vlan 1 interface
gigabitEthernet 1/1 delete-on-reset
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

port security enable

To enable port security learning mode on an interface, use the **port security** command. To disable port security learning mode on an interface, use the no form of this command.

port security enable

noport security enable

Syntax Description

enable	Enable port security on an interface.

Command Default

The feature is disabled by default.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.10.1	This command was introduced.

Usage Guidelines

None

Example

The following example enables port security:

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch)# port-security enable
nfvis(config-switch)# commit
```

port security max

To configure the maximum number of addresses that can be learned on the port while the port is in port, max-addresses or secure mode, use the **port security max** command. To restore the default configuration, use the no form of this command.

port security max *max-addr*

noport securitymax

Syntax Description

max-addr	Specifies the maximum number of addresses that can be learned on the port. Valid range is from 0 to 256.

Command Default

This default maximum number of addresses is 1.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.10.1	This command was introduced.

Usage Guidelines

The command may be used only when the interface in the regular (non-secure with unlimited MAC learning) mode.

Use this command to change the default value before the **port security** command.

Example

The following example configures max mac address:

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch)# port-security max 5
nfvis(config-switch)# commit
```

port security violation

To discard packets or shutdown interface with unlearned source address, use **port-security violation** command.

port security violation [**discardshutdown**]

Syntax Description

discard	Discards packets with unlearned source addresses.
shutdown	Discards packets with unlearned source addresses and shuts down the port.

Command Default

The default mode is discard.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.10.1	This command was introduced.

Usage Guidelines

None

Example

The following example enables port security:

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch)# port-security violation shutdown
nfvis(config-switch)# commit
```

switch clear mac address-table

To remove learned or secure entries from the forwarding database (FDB) for a Gigabit Ethernet or port channel interface, use the **switch clear mac address-table** command in privileged EXEC mode.

switch clear mac address-table dynamic [{**gigabitEthernet** | **port-channel**} *interface-id*]

Syntax Description

dynamic	Deletes all dynamic (learned) addresses.
gigabitEthernet	Specifies gigabitEthernet as the interface type.
port-channel	Specifies port channel as the interface type.
interface-id	Specifies the interface ID.

Command Default

If *interface-id* is not provided, all dynamic entries are deleted.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.6.1	The port-channel parameter was added.
3.5.1	This command was introduced.

Example

Delete all dynamic entries from the FDB.

```
nfvis# switch clear mac address-table dynamic
```

show ports security

To display the port-lock status, use the **show ports security** command.

showports security [*interface-id* | **detailed**]

Syntax Description

detailed	Displays information for non-present ports in addition to present ports.
interface-id	Specifies an interface ID. The interface ID can be one of the following types: Ethernet port or port-channel.

Command Default

Display for all interfaces. If detailed is not used, only present ports are displayed.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.10.1	This command was introduced.

Usage Guidelines

None

Example

The following example verifies the configuration:

```
nfvis# show switch interface port-security
MAC
VIOLATION ADDRESS MAX MAC
PORT STATUS LEARNING HANDLING COUNT ADDRESS
-----------------------------------------------------------------
1/0 Disabled Delete-On-Reset Discard 0 0
1/1 Enabled Delete-On-Reset Discard 1 5
1/2 Disabled Delete-On-Reset Discard 0 0
1/3 Disabled Delete-On-Reset Discard 0 0
1/4 Disabled Delete-On-Reset Discard 0 0
1/5 Disabled Delete-On-Reset Discard 0 0
1/6 Disabled Delete-On-Reset Discard 0 0
1/7 Disabled Delete-On-Reset Discard 0 0
```

show switch mac addr-table

To display entries in the MAC address table, use the **show switch mac addr-table** command in privileged EXEC mode.

show switch mac addr-table *vlan-id*

Syntax Description

vlan-id	Specifies the VLAN ID.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following is a sample output of the **show switch mac addr-table** command:

```
nfvis# show switch mac addr-table 1
VLAN  MAC ADDRESS        PORT   TYPE
---------------------------------------------------------------
1     00:22:bd:fb:af:41  gi1/6  dynamic
1     00:22:bd:fb:af:42  gi1/7  dynamic
1     00:22:bd:fb:af:80  gi1/5  dynamic
1     00:25:45:92:e7:aa  gi1/1  dynamic
1     00:3a:7d:94:78:92  gi1/1  dynamic
1     00:a6:ca:d6:31:34  none   self
1     0c:d9:96:91:06:06  gi1/4  dynamic
```

Ethernet Configuration Commands

interface

To enter the interface configuration mode to configure a Gigabit Ethernet or port channel interface, use the **interface** command in switch configuration mode.

interface {**gigabitEthernet** {*interface-id* | *interface-range*} | **port-channel** {*portchannel-id* | **range** *portchannel-range*}}

Syntax Description

gigabitEthernet	Specifies Gigabit Ethernet as the interface type.
interface-id	Specifies an interface ID.
interface-range	Specifies a range for the Giganit Ethernet interfaces. Enter the range in the following format: 1/1-3.
port-channel	Specifies port channel as the interface type.
portchannel-id	Specifies a port channel.
range *portchannel-range*	Specifies a range for port channels. Enter the range in the following format: 1-3

Command Default

None

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.6.1	The port-channel and range parameters are added.
3.5.1	This command was introduced.

Example

Use the following example to enter the configuration mode for the interfaces 1/0 and 1/1.

```
nfvis(config-switch)# interface gigabitEthernet 1/0-1
nfvis(config-switch-if)#
```

Example

Use the following example to enter the configuration mode for port channels 1 and 2.

```
nfvis(config-switch)# interface port-channel range 1-2
nfvis(config-switch-if)#
```

description

To add a description to an interface, use the **description** command in interface switch configuration mode. To remove the description, use the **no** form of the command.

description *string*
no description

Syntax Description

string	Specifies a comment or a description of the port to assist the user. Length: 1–64 characters

Command Default

The interface does not have a description.

Command Modes

Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example adds a description for the Gigabit Ethernet 1/1 interface:

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# description SW#1
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

duplex

To configure the full duplex operation on a Gigabit Ethernet interface when not using auto-negotiation, use the **duplex** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

duplex full
no duplex

Syntax Description

full	Forces full-duplex operation.

Command Default

The interface operates in the full duplex mode.

Command Modes

Interface (Gigabit Ethernet) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example configures the Gigabit Ethernet interface 1/1 to operate in a full duplex mode.

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# duplex full
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

flowcontrol receive

To configure flow control on an interface, use the **flowcontrol receive** command in interface switch configuration mode. To disable flow control, use the **no** form of this command.

flowcontrol receive {**on** | **off**}
no flowcontrol receive

Syntax Description

on	Enables flow control.
off	Disables flow control.

Command Default

Flow control is disabled.

Command Modes

Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example enables flow control on port channel 1:

```
nfvis(config-switch)# interface port-channel 1
nfvis(config-switch-if)# flowcontrol receive on
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

mdix

To enable cable crossover on a Gigabit Ethernet interface, use the **mdix** command in the interface switch configuration mode. To disable cable crossover, use the **no** form of this command.

mdix {**auto** | **on**}
no mdix

Syntax Description

on	Enables manual MDIX.
auto	Enables automatic MDI/MDIX.

Command Default

The default is Auto.

Command Modes

Interface (Gigabit Ethernet) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example enables automatic crossover on Gigabit Ethernet interface 1/1:

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# mdix auto
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

negotiation

To enable auto-negotiation operation for the speed and duplex parameters of an interface, use the **negotiation** command in interface switch configuration mode. To disable auto-negotiation, use the **no** form of this command.

negotiation auto
no negotiation

Syntax Description

auto	Specifies the auto negotiation of the speed and duplex mode.

Command Default

Enabled by default.

Command Modes

Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example enables auto-negotiation on the Gigabit Ethernet interface 1/1:

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# negotiation auto
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

shutdown

To disable an interface, use the **shutdown** command in the interface switch configuration mode. To restart a disabled interface, use the **no** form of this command.

shutdown
no shutdown

Syntax Description

This command has no arguments.

Command Default

The interface is enabled.

Command Modes

Interface (Gigabit Ethernet, Port Channel, VLAN) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

The **shutdown** command sets the value of **ifAdminStatus** (see RFC 2863) to **DOWN**. When **ifAdminStatus** is changed to **DOWN**, **ifOperStatus** is also be changed to **DOWN**.

The **DOWN** state of **ifOperStatus** implies that the interface does not transmit to or receive messages from higher levels. For example, if you shut down a VLAN on which an IP interface is configured, bridging into the VLAN continues but the switch cannot transmit and receive IP traffic on the VLAN.

Example 1

The following example disables the Gigabit Ethernet interface 1/1:

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# shutdown
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

Example 2

The following example restarts the disabled interface:

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# no shutdown
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

speed

To configure the speed of a given Ethernet interface when not using auto-negotiation, use the **speed** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

speed {*10* | *100* | *1000*}
no speed

Syntax Description

10	Forces 10 Mbps operation.
100	Forces 100 Mbps operation.
1000	Forces 1000 Mbps operation.

Command Default

The port operates at its maximum speed capability.

Command Modes

Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

The **no speed** command in a port-channel mode returns each port in the port channel to its maximum capability.

Example

The following example configures the speed of Gigabit Ethernet interface 1/1 to 100 Mbps operation:

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# speed 100
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

switchport access vlan

A port in access mode can be an untagged member of a single VLAN. To reassign an interface to a different VLAN than it currently belongs to, use the **switchport access vlan** command in interface switch configuration mode. Use the **no** form of the command to restore the default configuration.

switchport access vlan *vlan-id*
no switchport access vlan

Syntax Description

vlan *vlan-id*	Specifies the VLAN ID. Valid range is: • 1 to 2349 • 2450 to 4093

Command Default

None

Command Modes

Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

When the port is assigned to a different VLAN, it is automatically removed from its previous VLAN and added to the new VLAN. A non-existing VLAN can be assigned as an access VLAN.

Example

The following example shows how to assign a VLAN to an interface:

```
nfvis(config-switch)# interface gigabitEthernet 1/0
nfvis(config-switch-if)# switchport mode access
nfvis(config-switch-if)# switchport access vlan 2
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

switchport community

To associate a protected port with a community, use the **switchport community** command in interface switch configuration mode. Use the **no** form of this command to return to the default.

switchport community *number*
no switchport community

Syntax Description

community *number*	Specifies the community number. Valid range is from 1 to 29.

Command Default

None

Command Modes

Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

The command is relevant only when the port is defined as a protected port. Use the **switchport protected-port** command in interface switch configuration mode to define a port as a protected port.

Example

The following example shows how to associate a protected port with a community:

```
nfvis(config-switch)# interface gigabitEthernet 1/0
nfvis(config-switch-if)# switchport community 1
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

switchport dot1q-tunnel vlan

To set a port's VLAN when the port is in dot1q-tunnel mode (set by the **switchport mode** command), use the **switchport dot1q-tunnel vlan** command in interface configuration mode. Use the **no** form of this command to restore the default configuration.

switchport dot1q-tunnel vlan *vlan-id*

Syntax Description

vlan-id	Specifies a VLAN ID.

Command Default

No VLAN is configured as dot1q-tunnel.

Command Modes

Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.6.1	This command was introduced.

Usage Guidelines

When a port is in dot1q-tunnel mode, it is in QinQ mode. This mode allows you to use your own VLAN arrangements (PVID) across a provider network. The switch is in QinQ mode when it has one or more dot1q-tunnel ports.

Example

The following example defines the Gigabit Ethernet interface 1/0 as a member of dot1q-tunnel VLAN 5.

```
nfvis(config)# switch
nfvis(config-switch)# interface gigabitEthernet 1/0
nfvis(config-switch-if)# switchport dot1q-tunnel vlan 5
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

switchport mode

To configure the VLAN membership mode, use the **switchport mode** command in interface switch configuration mode. Use the **no** form of this command to restore the default configuration.

switchport mode {**access** | **dot1q-tunnel** | **private-vlan** | **trunk**}
no switchport mode

Syntax Description

access	Specifies an untagged layer 2 VLAN port.
dot1q-tunnel	Specifies the Layer 2 port as a tunnel port.
private-vlan	Specifies a private VLAN port.
trunk	Specifies a trunking layer 2 VLAN port.

Command Default

Access mode is configured.

Command Modes

Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

When the port's mode is changed, it receives the configuration corresponding to the mode. If the port mode is changed to access, and the access VLAN does not exist, then the port does not belong to any VLAN.

Example

The following example shows how to configure the Gigabit Ethernet interface 1/0 as an access port (untagged layer 2 VLAN port).

```
nfvis(config-switch)# interface gigabitEthernet 1/0
nfvis(config-switch-if)# switchport mode access
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

switchport protected-port

To isolate unicast, multicast, and broadcast traffic at Layer 2 from other protected ports on the same switch, use the **switchport protected-port** command in interface switch configuration mode. Use the **no** form of this command to disable protection on the port.

switchport protected-port
no switchport protected-port

Syntax Description

This command has no arguments.

Command Default

Protection is disabled by default.

Command Modes

Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

Use this command to isolate Unicast, Multicast, and Broadcast traffic at Layer 2 from other protected ports (not associated with the same community as the ingress interface) on the same switch. Packets are subject to all filtering rules and Filtering Database (FDB) decisions.

Example

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# switchport protected-port
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

switchport trunk allowed vlan

To tag a single VLAN or multiple VLANs to a trunk port, use the **switchport trunk allowed vlan** command in interface switch configuration mode. Use the **no** form of the command to return to the default.

switchport trunk allowed vlan *vlan-id*
no switchport trunk allowed vlan

Syntax Description

allowed vlan	Tags a VLAN to the trunk port.
vlan-id	Specifies the VLAN ID. Valid range is from: • 1 to 2349 • 2450 to 4093

Command Default

By default, a trunk port belongs to all created VLANs.

Command Modes

Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

Use the **switchport trunk allowed vlan** command to specify the VLANs to which a port belongs when its mode is configured as trunk. When a non-existing VLAN is created, the port is automatically added to it. You can also configure forbidden VLANs.

Example

The following example shows how to tag a VLAN to a trunk port:

```
nfvis(config-switch)# interface gigabitEthernet 1/0
nfvis(config-switch-if)# switchport mode trunk
nfvis(config-switch-if)# switchport trunk allowed vlan 1
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

switchport trunk allowed vlan vlan-range

This command performs the same action as in **switch trunk allowed vlan** command. It is also used to tag a single VLAN or multiple VLANs to a trunk port, use the switchport trunk allowed vlan vlan-range command in interface switch configuration mode. Use the no form of the command to return to the default.

switchport trunk allowed vlanvlan-range*vlan-id*
no switchport trunk allowed vlan

Syntax Description

allowed vlan vlan-range	Tags a VLAN to the trunk port.
vlan-id	Specifies the VLAN ID. Valid range is from: • 1 to 2349 • 2450 to 4093

Command Default

By default, a trunk port belongs to all created VLANs.

Command Modes

Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.12.1	This command was introduced.

Usage Guidelines

Use the **switchport trunk allowed vlan vlan-range** command to specify the VLANs to which a port belongs when its mode is configured as trunk. This command overwrites the existing vlan configuration. For example, if the current configuration is vlan-range 1-10, then the command **switchport trunk allowed vlan vlan-range 5-20** overwrites the vlan-range 1-10. The configuration contains vlans 5-20 only.

The **switchport trunk allowed vlan** command uses list type and **switchport trunk allowed vlan vlan-range** command uses string type. When using RESTAPI or NETCONF API, **switchport trunk allowed vlan** you need to specify one entry per VLAN in XML notation and **switchport trunk allowed vlan vlan-range** you can specify a VLAN range in XML notation. This improves the performance when using RESTAPI or NETCONF API with vlan-range notation.

The default is to use the **switchport trunk allowed vlan** command. If you want to move to the **switchport trunk allowed vlan vlan-range** command, you should first use **no switchport trunk allowed vlan** before switching over to **switchport trunk allowed vlan vlan-range** command.

Example

The following example shows how to tag a VLAN to a trunk port:

```
nfvis(config-switch)# interface gigabitEthernet 1/0
nfvis(config-switch-if)# switchport mode trunk
nfvis(config-switch-if)# switchport trunk allowed vlan vlan-range 1-2349,2450-4093
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

switchport trunk native vlan

To define the native VLAN for a trunk interface, use the **switchport trunk native vlan** command in interface switch configuration mode. Use the **no** form of the command to restore the default native VLAN.

switchport trunk native vlan *vlan-id*
no switchport trunk native vlan

Syntax Description

native vlan	Defines a native VLAN for a trunk interface.
vlan-id	Specifies the VLAN ID. Valid range is from: • 1 to 2349 • 2450 to 4093

Command Default

The default native VLAN is configured.

Command Modes

Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

If an untagged packet arrives on a trunk port, it is directed to the native VLAN of the port. The value of the PVID interface is set to this VLAN ID. When the interface belongs to the native VLAN, the interface is set as VLAN untagged egress interface.

Example

The following example shows how to configure a native VLAN:

```
nfvis(config-switch)# interface gigabitEthernet 1/0
nfvis(config-switch-if)# switchport mode trunk
nfvis(config-switch-if)# switchport trunk native vlan 2
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

switch clear counters

To clear counters on all interfaces or on a specific interface, use the **switch clear counters** command in privileged EXEC mode.

switch clear counters [**gigabitEthernet** *interface-id*]

Syntax Description

interface-id	(Optional) Specifies an interface ID.

Command Default

All counters are cleared.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example clears the statistics counters for the Gigabit Ethernet interface 1/1:

```
nfvis# switch clear counters gigabitEthernet 1/1
```

show switch interface configuration

To display the configuration of all interfaces or a specific interface, use the **show switch interface configuration** command in privileged EXEC mode.

show switch interface configuration [{**gigabitEthernet** | **port-channel**} *interface-id*]

Syntax Description

gigabitEthernet	Specifies gigabitEthernet as the interface type.
port-channel	Specifies port channel as the interface type.
interface-id	Specifies the interface ID.

Command Default

Displays the configuration of all interfaces.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

None

Example

The following is a sample output of the **show switch interface configuration** command that displays the configuration of all interfaces:

```
nfvis# show switch interface configuration
 PORT  TYPE       DUPLEX  SPEED  NEG      CTRL  STATE  MODE
-------------------------------------------------------------
1/0   1G-Copper  full    1000   Enabled  off   Up     auto
1/1   1G-Copper  full    1000   Enabled  off   Up     auto
1/2   1G-Copper  full    1000   Enabled  off   Up     auto
1/3   1G-Copper  full    1000   Enabled  off   Up     auto
1/4   1G-Copper  full    1000   Enabled  off   Up     auto
1/5   1G-Copper  full    1000   Enabled  off   Up     auto
1/6   1G-Copper  full    1000   Enabled  off   Up     auto
1/7   1G-Copper  full    1000   Enabled  off   Up     auto

                                  FLOW  ADMIN
PORT  TYPE       SPEED  NEG      CTRL  STATE
---------------------------------------------
1     1G-Copper  1000   Enabled  off   Up
2     1G-Copper  0      Enabled  off   Up
3     1G-Copper  0      Enabled  off   Up
4     1G-Copper  0      Enabled  off   Up
```

show switch interface counters

To display traffic for all physical interfaces or a specific interface, use the **show switch interface counters** command in privileged EXEC mode.

show switch interface counters [{**gigabitEthernet** | **port-channel**} *interface-id*]

Syntax Description

gigabitEthernet	Specifies Gigabit Ethernet as the interface type.
port-channel	Specifies port channel as the interface type.
interface-id	Specifies the interface ID.

Command Default

Displays traffic seen by all physical interfaces.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

For verification and the command output display, use the **show switch interface counters** command. For debugging, use the **switch show interface counters command**.

Example

The following is a sample output of the **show switch interface counters** command that displays traffic for all physical interfaces:

```
nfvis# show switch interface counters
      IN      IN      IN                OUT     OUT     OUT
      UCAST   MCAST   BCAST   IN        UCAST   MCAST   BCAST   OUT
PORT  PKTS    PKTS    PKTS    OCTETS    PKTS    PKTS    PKTS    OCTETS
-------------------------------------------------------------------------
1/0   0       10294   0       4549003   8991    781378  385601  99211858
1/1   0       27730   107369  10101659  8991    782425  278232  94933385
1/2   0       18486   0       1275504   8979    791617  385589  103748317
1/3   0       0       0       0         0       0       0       0
1/4   0       0       0       0         0       0       0       0
1/5   0       18503   22324   17477800  8970    782386  363263  89621499
1/6   0       0       0       0         0       0       0       0
1/7   12888   744128  255908  74922054  0       47279   129693  29593513

      IN      IN      IN              OUT     OUT     OUT
      UCAST   MCAST   BCAST   IN      UCAST   MCAST   BCAST   OUT
PORT  PKTS    PKTS    PKTS    OCTETS  PKTS    PKTS    PKTS    OCTETS
-----------------------------------------------------------------
1     0       0       0       0       0       0       0       0
2     0       0       0       0       0       0       0       0
3     0       0       0       0       0       0       0       0
4     0       0       0       0       0       0       0       0
```

The following table describes the significant fields shown in the command output.

Table 1: show switch interface counters Field Description

Field	Description
PORT	Port number
IN and OUT UCAST PKTS	Number of received and transmitted unicast packets.
IN and OUT MCAST PKTS	Number of received and transmitted multicast packets.
IN and OUT BCAST PKTS	Number of received and transmitted broadcast packets.
IN and OUT OCTETS	Number of received and transmitted octets.

show switch interface protected

To display the configuration of all protected interfaces or a specific interface, use the **show switch interface protected** command in privileged EXEC mode.

show switch interface protected [**gigabitEthernet** *interface-id*]

Syntax Description

gigabitEthernet *interface-id*	Specifies the Gigabit Ethernet interface ID.

Command Default

Displays the configuration of all protected interfaces.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

None

Example

The following is a sample output of the **show switch interface protected** command that displays the configuration of all protected interfaces:

```
nfvis# show switch interface protected
PORT  STATE        COMMUNITY
------------------------------
1/0   Unprotected  Isolated
1/1   Unprotected  Isolated
1/2   Unprotected  Isolated
1/3   Unprotected  Isolated
1/4   Unprotected  Isolated
1/5   Unprotected  Isolated
1/6   Unprotected  Isolated
1/7   Unprotected  Isolated
```

show switch interface rmon

To display the RMON statistics for all interfaces or a specific interface, use the **show switch interface rmon** command in privileged EXEC mode.

show switch interface rmon [{**gigabitEthernet** | **port-channel**} *interface-id*]

Syntax Description

gigabitEthernet	Specifies Gigabit Ethernet as the interface type.
port-channel	Specifies port channel as the interface type.
interface-id	Specifies the interface ID.

Command Default

Displays the RMON statistics for all interfaces.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

For verification and the command output display, use the **show switch interface rmon** command. For debugging, use the **switch show interface rmon** command.

Example

The following is a sample output of the **show switch interface rmon** command that displays the RMON statistics for all interfaces:

```
nfvis# show switch interface rmon

interface rmon gigabitEthernet 1/0
 DropEventCnt              0
 RxPktByteCnt              4600717
 RxPktCnt                  10411
 RxMPktCnt                 10411
 RxBPktCnt                 0
 CRCErrCnt                 0
 UnderSizePktCnt           0
 OverSizePktCnt            0
 FragmentCnt               0
 JabberCnt                 0
 CollisionCnt              0
 FrameOf64BytesCnt         517534
 FrameOf65To127BytesCnt    553976
 FrameOf128To255BytesCnt   84394
 FrameOf256To511BytesCnt   21145
 FrameOf512To1023BytesCnt  22588
 FrameOf1024To1518BytesCnt 0


interface rmon gigabitEthernet 1/1
 DropEventCnt              0
```

```
 RxPktByteCnt              10215853
 RxPktCnt                  136624
 RxMPktCnt                 28048
 RxBPktCnt                 108576
 CRCErrCnt                 0
 UnderSizePktCnt           0
 OverSizePktCnt            0
 FragmentCnt               0
 JabberCnt                 0
 CollisionCnt              0
 FrameOf64BytesCnt         517539
 FrameOf65To127BytesCnt    572669
 FrameOf128To255BytesCnt   84394
 FrameOf256To511BytesCnt   21142
 FrameOf512To1023BytesCnt  22588
 FrameOf1024To1518BytesCnt 0


interface rmon gigabitEthernet 1/2
 DropEventCnt              0
 RxPktByteCnt              1290132
 RxPktCnt                  18698
 RxMPktCnt                 18698
 RxBPktCnt                 0
 CRCErrCnt                 0
 UnderSizePktCnt           0
 OverSizePktCnt            0
 FragmentCnt               0
 JabberCnt                 0
 CollisionCnt              0
 FrameOf64BytesCnt         517524
 FrameOf65To127BytesCnt    572648
 FrameOf128To255BytesCnt   84385
 FrameOf256To511BytesCnt   21128
 FrameOf512To1023BytesCnt  22588
 FrameOf1024To1518BytesCnt 0


interface rmon gigabitEthernet 1/3
 DropEventCnt              0
 RxPktByteCnt              0
 RxPktCnt                  0
 RxMPktCnt                 0
 RxBPktCnt                 0
 CRCErrCnt                 0
 UnderSizePktCnt           0
 OverSizePktCnt            0
 FragmentCnt               0
 JabberCnt                 0
 CollisionCnt              0
 FrameOf64BytesCnt         0
 FrameOf65To127BytesCnt    0
 FrameOf128To255BytesCnt   0
 FrameOf256To511BytesCnt   0
 FrameOf512To1023BytesCnt  0
 FrameOf1024To1518BytesCnt 0


interface rmon gigabitEthernet 1/4
 DropEventCnt              0
 RxPktByteCnt              0
 RxPktCnt                  0
 RxMPktCnt                 0
 RxBPktCnt                 0
```

```
 CRCErrCnt                0
 UnderSizePktCnt          0
 OverSizePktCnt           0
 FragmentCnt              0
 JabberCnt                0
 CollisionCnt             0
 FrameOf64BytesCnt        0
 FrameOf65To127BytesCnt   0
 FrameOf128To255BytesCnt  0
 FrameOf256To511BytesCnt  0
 FrameOf512To1023BytesCnt 0
 FrameOf1024To1518BytesCnt 0


interface rmon gigabitEthernet 1/5
 DropEventCnt             0
 RxPktByteCnt             17682398
 RxPktCnt                 41305
 RxMPktCnt                18720
 RxBPktCnt                22585
 CRCErrCnt                0
 UnderSizePktCnt          0
 OverSizePktCnt           0
 FragmentCnt              0
 JabberCnt                0
 CollisionCnt             0
 FrameOf64BytesCnt        517608
 FrameOf65To127BytesCnt   554083
 FrameOf128To255BytesCnt  84408
 FrameOf256To511BytesCnt  30492
 FrameOf512To1023BytesCnt 22593
 FrameOf1024To1518BytesCnt 0


interface rmon gigabitEthernet 1/6
 DropEventCnt             0
 RxPktByteCnt             0
 RxPktCnt                 0
 RxMPktCnt                0
 RxBPktCnt                0
 CRCErrCnt                0
 UnderSizePktCnt          0
 OverSizePktCnt           0
 FragmentCnt              0
 JabberCnt                0
 CollisionCnt             0
 FrameOf64BytesCnt        0
 FrameOf65To127BytesCnt   0
 FrameOf128To255BytesCnt  0
 FrameOf256To511BytesCnt  0
 FrameOf512To1023BytesCnt 0
 FrameOf1024To1518BytesCnt 0


interface rmon gigabitEthernet 1/7
 DropEventCnt             0
 RxPktByteCnt             75773941
 RxPktCnt                 1024494
 RxMPktCnt                752808
 RxBPktCnt                258687
 CRCErrCnt                0
 UnderSizePktCnt          0
 OverSizePktCnt           0
 FragmentCnt              0
```

```
 JabberCnt                 0
 CollisionCnt              0
 FrameOf64BytesCnt         519383
 FrameOf65To127BytesCnt    555242
 FrameOf128To255BytesCnt   84785
 FrameOf256To511BytesCnt   21148
 FrameOf512To1023BytesCnt  22609
 FrameOf1024To1518BytesCnt 353


interface rmon port-channel 1
 DropEventCnt              0
 RxPktByteCnt              0
 RxPktCnt                  0
 RxMPktCnt                 0
 RxBPktCnt                 0
 CRCErrCnt                 0
 UnderSizePktCnt           0
 OverSizePktCnt            0
 FragmentCnt               0
 JabberCnt                 0
 CollisionCnt              0
 FrameOf64BytesCnt         0
 FrameOf65To127BytesCnt    0
 FrameOf128To255BytesCnt   0
 FrameOf256To511BytesCnt   0
 FrameOf512To1023BytesCnt  0
 FrameOf1024To1518BytesCnt 0


interface rmon port-channel 2
 DropEventCnt              0
 RxPktByteCnt              0
 RxPktCnt                  0
 RxMPktCnt                 0
 RxBPktCnt                 0
 CRCErrCnt                 0
 UnderSizePktCnt           0
 OverSizePktCnt            0
 FragmentCnt               0
 JabberCnt                 0
 CollisionCnt              0
 FrameOf64BytesCnt         0
 FrameOf65To127BytesCnt    0
 FrameOf128To255BytesCnt   0
 FrameOf256To511BytesCnt   0
 FrameOf512To1023BytesCnt  0
 FrameOf1024To1518BytesCnt 0


interface rmon port-channel 3
 DropEventCnt              0
 RxPktByteCnt              0
 RxPktCnt                  0
 RxMPktCnt                 0
 RxBPktCnt                 0
 CRCErrCnt                 0
 UnderSizePktCnt           0
 OverSizePktCnt            0
 FragmentCnt               0
 JabberCnt                 0
 CollisionCnt              0
 FrameOf64BytesCnt         0
 FrameOf65To127BytesCnt    0
```

```
 FrameOf128To255BytesCnt   0
 FrameOf256To511BytesCnt   0
 FrameOf512To1023BytesCnt  0
 FrameOf1024To1518BytesCnt 0


interface rmon port-channel 4
 DropEventCnt              0
 RxPktByteCnt              0
 RxPktCnt                  0
 RxMPktCnt                 0
 RxBPktCnt                 0
 CRCErrCnt                 0
 UnderSizePktCnt           0
 OverSizePktCnt            0
 FragmentCnt               0
 JabberCnt                 0
 CollisionCnt              0
 FrameOf64BytesCnt         0
 FrameOf65To127BytesCnt    0
 FrameOf128To255BytesCnt   0
 FrameOf256To511BytesCnt   0
 FrameOf512To1023BytesCnt  0
 FrameOf1024To1518BytesCnt 0
```

show switch interface status

To display the status of all interfaces or a specific interface, use the **show switch interface status** command in privileged EXEC mode.

show switch interface status [{**gigabitEthernet** | **port-channel**} *interface-id*]

Syntax Description

gigabitEthernet	Specifies Gigabit Ethernet as the interface type.
port-channel	Specifies port channel as the interface type.
interface-id	Specifies the interface ID.

Command Default

Displays the status of all interfaces.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

For verification and the command output display, use the **show switch interface status** command. For debugging, use the **switch show interface status** command.

Example

The following is a sample output of the **show switch interface status** command that displays the status of all interfaces:

```
nfvis# show switch interface status
                                  MEDIA
PORT  TYPE       LINK  SPEED  TYPE   MACADDR            MTU
-----------------------------------------------------------------
1/0   1G-Copper  up    1000   RJ45   00:a6:ca:d6:31:35  9216
1/1   1G-Copper  up    1000   RJ45   00:a6:ca:d6:31:36  9216
1/2   1G-Copper  up    1000   RJ45   00:a6:ca:d6:31:37  9216
1/3   1G-Copper  down  1000   RJ45   00:a6:ca:d6:31:38  9216
1/4   1G-Copper  down  1000   RJ45   00:a6:ca:d6:31:39  9216
1/5   1G-Copper  up    1000   RJ45   00:a6:ca:d6:31:3a  9216
1/6   1G-Copper  down  1000   RJ45   00:a6:ca:d6:31:3b  9216
1/7   1G-Copper  up    1000   RJ45   00:a6:ca:d6:31:3c  9216

PORT  TYPE          SPEED  LINK
----------------------------------------
1     Port-Channel  0      Not Presence
2     Port-Channel  0      Not Presence
3     Port-Channel  0      Not Presence
4     Port-Channel  0      Not Presence
```

The following table describes the significant fields shown in the command display.

Table 2: show switch interface status Field Description

Field	Description
PORT	Port number
TYPE	Interface type
LINK	Link status (up or down)
SPEED	Interface speed in Mbps
MEDIA TYPE	Number of received and transmitted octets.
MACADDR	MAC address
MTU	Maximum transmission unit

show switch interface switchPort

To display the switchport information of all interfaces or a specific interface, use the **show switch interface switchPort** command in privileged EXEC mode.

show switch interface switchPort [{**gigabitEthernet** | **port-channel**} *interface-id*]

Syntax Description

gigabitEthernet	Specifies Gigabit Ethernet as the interface type.
port-channel	Specifies port channel as the interface type.
interface-id	Specifies the interface ID.

Command Default

Displays switchport information of all interfaces.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

For verification and the command output display, use the **show switch interface switchPort** command. For debugging, use the **switch show interface switchPort** command.

Example

The following is a sample output of the **show switch interface switchPort** command that displays switchport information of all interfaces:

```
nfvis# show switch interface switchPort

interface switchPort gigabitEthernet 1/0
 switchport-mode                                    enable
 adminstrative-mode                                 access
 operational-mode                                   Up
 access-mode-vlan                                   1
 trunk-native-mode-vlan                             1
 trunking-vlans                                     1-2349,2450-4093
 Privatevlan-promiscuous-association-primary-VLAN   none
 Privatevlan-promiscuous-association-secondary-VLAN none
 Privatevlan-host-association-primary-VLAN          none
 Privatevlan-host-association-secondary-VLAN        none


interface switchPort gigabitEthernet 1/1
 switchport-mode                                    enable
 adminstrative-mode                                 access
 operational-mode                                   Up
 access-mode-vlan                                   1
 trunk-native-mode-vlan                             1
 trunking-vlans                                     1-2349,2450-4093
 Privatevlan-promiscuous-association-primary-VLAN   none
 Privatevlan-promiscuous-association-secondary-VLAN none
```

```
 Privatevlan-host-association-primary-VLAN          none
 Privatevlan-host-association-secondary-VLAN        none


interface switchPort gigabitEthernet 1/2
 switchport-mode                                    enable
 adminstrative-mode                                 access
 operational-mode                                   Up
 access-mode-vlan                                   1
 trunk-native-mode-vlan                             1
 trunking-vlans                                     1-2349,2450-4093
 Privatevlan-promiscuous-association-primary-VLAN   none
 Privatevlan-promiscuous-association-secondary-VLAN none
 Privatevlan-host-association-primary-VLAN          none
 Privatevlan-host-association-secondary-VLAN        none


interface switchPort gigabitEthernet 1/3
 switchport-mode                                    enable
 adminstrative-mode                                 access
 operational-mode                                   Down
 access-mode-vlan                                   1
 trunk-native-mode-vlan                             1
 trunking-vlans                                     1-2349,2450-4093
 Privatevlan-promiscuous-association-primary-VLAN   none
 Privatevlan-promiscuous-association-secondary-VLAN none
 Privatevlan-host-association-primary-VLAN          none
 Privatevlan-host-association-secondary-VLAN        none


interface switchPort gigabitEthernet 1/4
 switchport-mode                                    enable
 adminstrative-mode                                 access
 operational-mode                                   Down
 access-mode-vlan                                   1
 trunk-native-mode-vlan                             1
 trunking-vlans                                     1-2349,2450-4093
 Privatevlan-promiscuous-association-primary-VLAN   none
 Privatevlan-promiscuous-association-secondary-VLAN none
 Privatevlan-host-association-primary-VLAN          none
 Privatevlan-host-association-secondary-VLAN        none


interface switchPort gigabitEthernet 1/5
 switchport-mode                                    enable
 adminstrative-mode                                 access
 operational-mode                                   Up
 access-mode-vlan                                   1
 trunk-native-mode-vlan                             1
 trunking-vlans                                     1-2349,2450-4093
 Privatevlan-promiscuous-association-primary-VLAN   none
 Privatevlan-promiscuous-association-secondary-VLAN none
 Privatevlan-host-association-primary-VLAN          none
 Privatevlan-host-association-secondary-VLAN        none


interface switchPort gigabitEthernet 1/6
 switchport-mode                                    enable
 adminstrative-mode                                 access
 operational-mode                                   Down
 access-mode-vlan                                   1
 trunk-native-mode-vlan                             1
 trunking-vlans                                     1-2349,2450-4093
 Privatevlan-promiscuous-association-primary-VLAN   none
```

```
 Privatevlan-promiscuous-association-secondary-VLAN none
 Privatevlan-host-association-primary-VLAN          none
 Privatevlan-host-association-secondary-VLAN        none


interface switchPort gigabitEthernet 1/7
 switchport-mode                                    enable
 adminstrative-mode                                 access
 operational-mode                                   Up
 access-mode-vlan                                   1
 trunk-native-mode-vlan                             1
 trunking-vlans                                     1-2349,2450-4093
 Privatevlan-promiscuous-association-primary-VLAN   none
 Privatevlan-promiscuous-association-secondary-VLAN none
 Privatevlan-host-association-primary-VLAN          none
 Privatevlan-host-association-secondary-VLAN        none


interface switchPort port-channel 1
 switchport-mode                                    enable
 adminstrative-mode                                 access
 operational-mode                                   "Not Presence"
 access-mode-vlan                                   1
 trunk-native-mode-vlan                             1
 trunking-vlans                                     1
 Privatevlan-promiscuous-association-primary-VLAN   none
 Privatevlan-promiscuous-association-secondary-VLAN none
 Privatevlan-host-association-primary-VLAN          none
 Privatevlan-host-association-secondary-VLAN        none


sinterface switchPort port-channel 2
 switchport-mode                                    enable
 adminstrative-mode                                 access
 operational-mode                                   "Not Presence"
 access-mode-vlan                                   1
 trunk-native-mode-vlan                             1
 trunking-vlans                                     1
 Privatevlan-promiscuous-association-primary-VLAN   none
 Privatevlan-promiscuous-association-secondary-VLAN none
 Privatevlan-host-association-primary-VLAN          none
 Privatevlan-host-association-secondary-VLAN        none


interface switchPort port-channel 3
 switchport-mode                                    enable
 adminstrative-mode                                 access
 operational-mode                                   "Not Presence"
 access-mode-vlan                                   1
 trunk-native-mode-vlan                             1
 trunking-vlans                                     1
 Privatevlan-promiscuous-association-primary-VLAN   none
 Privatevlan-promiscuous-association-secondary-VLAN none
 Privatevlan-host-association-primary-VLAN          none
 Privatevlan-host-association-secondary-VLAN        none


interface switchPort port-channel 4
 switchport-mode                                    enable
 adminstrative-mode                                 access
 operational-mode                                   "Not Presence"
 access-mode-vlan                                   1
 trunk-native-mode-vlan                             1
 trunking-vlans                                     1
```

```
Privatevlan-promiscuous-association-primary-VLAN   none
Privatevlan-promiscuous-association-secondary-VLAN none
Privatevlan-host-association-primary-VLAN          none
Privatevlan-host-association-secondary-VLAN        none
```

show switch interface inline-status

To display the inline power status of all interfaces or a specific interface, use the **show switch interface inline-status** command in privileged EXEC mode.

show switch interface inline-status [{**gigabitEthernet** *interface-id*}]

Syntax Description

gigabitEthernet *interface-id*	Specifies the Gigabit Ethernet interface ID.

Command Default

Displays the inline power status of all interfaces.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

For verification and the command output display, use the **show switch interface inline-status** command. For debugging, use the **switch show interface inline-status** command.

Example

The following command output displays the inline power status of all interfaces:

```
nfvis# show switch interface inline-status
PORT  ADMIN  OPER       POWER  CLASS  DEVICE  PRIORITY
-----------------------------------------------------------
1/0   auto   Searching  0.0    0      None    low
1/1   auto   Searching  0.0    0      None    low
1/2   auto   Searching  0.0    0      None    low
1/3   auto   Searching  0.0    0      None    low
1/4   auto   Searching  0.0    0      None    low
1/5   auto   On         6.5    4      None    low
1/6   auto   Searching  0.0    0      None    low
1/7   auto   Searching  0.0    0      None    low
```

IGMP Snooping Commands

ip igmp snooping enable (Global)

To enable Internet Group Management Protocol (IGMP) snooping, use the **ip igmp snooping enable** command in switch configuration mode. To return to the default, use the **no** form of this command.

ip igmp snooping enable
no ip igmp snooping enable

Syntax Description

This command does not have any arguments

Command Default

Disabled

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example enables IGMP snooping:

```
nfvis(config-switch)# ip igmp snooping enable
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

ip igmp snooping querier enable

To enable IGMP Snooping querier globally, use the **ip igmp snooping querier enable** command in switch configuration mode. To disable the IGMP Snooping querier globally, use the **no** form of this command.

ip igmp snooping querier enable
no ip igmp snooping querier enable

Syntax Description

This command has no arguments.

Command Default

Enabled

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

To run the IGMP Snooping querier on a VLAN, you have to enable it globally and on the VLAN.

Example

The following example disables the IGMP Snooping querier globally:

```
nfvis(config-switch)# no ip igmp snooping querier enable
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

ip igmp snooping vlan enable

To enable IGMP snooping on a specific VLAN, use the **ip igmp snooping vlan enable** command in switch configuration mode. To return to the default, use the **no** form of this command.

ip igmp snooping VLAN *vlan-id* **enable**
no ip igmp snooping VLAN *vlan-id* **enable**

Syntax Description

vlan-id	Specifies the VLAN.

Command Default

Disabled

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

IGMP snooping can be enabled only on static VLANs.

IGMPv1, IGMPv2, and IGMPv3 snooping are supported.

To activate IGMP snooping, bridge multicast filtering must be enabled using the **bridge multicast filtering** command.

Example

The following example enables IGMP snooping on VLAN 2:

```
nfvis(config-switch)# ip igmp snooping vlan 2 enable
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

ip igmp snooping vlan forbidden mrouter

To forbid a Gigabit Ethernet or port channel port from being defined as a Multicast router port by static configuration or by automatic learning, use the **ip igmp snooping vlan forbidden mrouter** command in switch configuration mode. To return to the default, use the **no** form of this command.

ip igmp snooping vlan *vlan-id* **forbidden mrouter interface** {**gigabitEthernet** | **port-channel**} *interface-id*
no ip igmp snooping vlan *vlan-id* **forbidden mrouter interface**

Syntax Description

vlan *vlan-id*	Specifies the VLAN ID.
interface	Specifies the interface type.
gigabitEthernet	Specifies Gigabit Ethernet as the interface type.
port-channel	Specifies port channel as the interface type.
interface-id	Specifies the interface ID.

Command Default

No ports are defined.

Command Modes

Switch configuration mode (config-switch)

Command History

Release	Modification
3.6.1	The port-channel parameter was added.
3.5.1	This command was introduced.

Usage Guidelines

A port that is defined as a Multicast router port receives all IGMP packets (reports and queries) as well as all multicast data.

You can execute the command before the VLAN is created.

Example

```
nfvis(config-switch)# ip igmp snooping vlan 2 forbidden mrouter interface gigabitEthernet
1/1

nfvis(config-switch)# commit
nfvis(config-switch)# end
```

ip igmp snooping vlan immediate-leave

To enable the IGMP Snooping Immediate-Leave processing on a VLAN, use the **ip igmp snooping vlan immediate-leave** command in switch configuration mode. To return to the default, use the **no** form of this command.

ip igmp snooping VLAN *vlan-id* **immediate-leave**
no ip igmp snooping VLAN *vlan-id* **immediate-leave**

Syntax Description

vlan-id	Specifies the VLAN ID.

Command Default

Disabled

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

You can run this command before creating the VLAN.

Example

The following example enables IGMP snooping immediate-leave feature on VLAN 2.

```
nfvis(config-switch)# ip igmp snooping vlan 2 immediate-leave
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

ip igmp snooping vlan querier address

To define the source IP address that the IGMP snooping querier uses, use the **ip igmp snooping vlan querier address** command in switch configuration mode. To return to the default, use the **no** form of this command.

ip igmp snooping VLAN *vlan-id* **querier address** *ip-address*
no ip igmp snooping VLAN *vlan-id* **querier address** *ip-address*

Syntax Description

vlan-id	Specifies the VLAN.
ip-address	Define the source IP address.

Command Default

If an IP address is configured for the VLAN, it is used as the source address of the IGMP snooping querier. If there are multiple IP addresses, the minimum IP address defined on the VLAN is used.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

If an IP address is not configured by this command, and no IP address is configured for the querier's VLAN, the querier is disabled.

Example

```
nfvis(config-switch)# ip igmp snooping vlan 1 querier address 192.0.2.1
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

ip igmp snooping vlan querier version

To configure the IGMP version of an IGMP Snooping querier on a specific VLAN, use the **ip igmp snooping vlan querier version** command in interface switch configuration mode. To return to the default, use the **no** form of this command.

ip igmp snooping VLAN *vlan-id* **querier version** {**2** | **3**}
no ip igmp snooping VLAN *vlan-id* **querier version** {**2** | **3**}

Syntax Description

vlan-id		Specifies the VLAN.
version	**2**	Specifies that the IGMP version would be IGMPv2.
version	**3**	Specifies that the IGMP version would be IGMPv3.

Command Default

IGMPv2.

Command Modes

Interface switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example sets the version of the IGMP Snooping Querier VLAN 1 to 3:

```
nfvis(config-switch)# ip igmp snooping vlan 1 querier version 3
```

ip igmp snooping vlan querier enable

To enable the IGMP Snooping querier on a specific VLAN, use the **ip igmp snooping vlan querier enable** command in switch configuration mode. To disable the IGMP Snooping querier on the VLAN interface, use the **no** form of this command.

ip igmp snooping VLAN *vlan-id* **querier enable**
no ip igmp snooping VLAN *vlan-id* **querier**

Syntax Description

vlan-id	Specifies the VLAN ID.

Command Default

Disabled

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

The IGMP Snooping querier can be enabled on a VLAN only if IGMP Snooping is enabled for that VLAN.

Example

The following example enables the IGMP Snooping querier on VLAN 1:

```
nfvis(config-switch)# ip igmp snooping vlan 1 querier enable
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

IGMP Commands

ip igmp last-member-query-count

To configure the IGMP last-member query counter, use the **ip igmp last-member-query-count** command in interface switch configuration mode. To restore the default counter value, use the **no** form of this command.

ip igmp last-member-query-count *count*
no ip igmp last-member-query-count

Syntax Description

count	Specifies the number of times that group- or group-source-specific queries are sent upon receipt of a message indicating a leave. Valid range is from 1–7.

Command Default

The value of IGMP Robustness variable.

Command Modes

Interface (VLAN) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

Use the **ip igmp robustness** command to configure the IGMP last-member query interval on an interface.

Example

The following example changes the value of IGMP last member query counter to 3:

```
nfvis(config-switch)# interface vlan 1
nfvis(config-switch-if)# ip igmp last-member-query-count 3
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

ip igmp last-member-query-interval

To configure the IGMP last-member query interval on an interface, use the **ip igmp last-member-query-interval** command in interface switch configuration mode. To restore the default IGMP query interval, use the **no** form of this command.

ip igmp last-member-query-interval *milliseconds*
no ip igmp last-member-query-interval

Syntax Description

milliseconds	Interval, in milliseconds, at which IGMP group-specific host query messages are sent on the interface. Valid range is from 100–25500.

Command Default

The default IGMP last member query interval is 1000 milliseconds.

Command Modes

Interface (VLAN) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

None

Example

The following example increases the IGMP last-member query interval to 1500 milliseconds:

```
nfvis(config-switch)# interface vlan 1
nfvis(config-switch-if)# ip igmp last-member-query-interval 1500
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

ip igmp query-max-response-time

To configure the maximum response time advertised in the IGMP queries, use the **ip igmp query-max-response-time** command in the interface switch configuration mode. To restore the default value, use the **no** form of this command.

ip igmp query-max-response-time *seconds*
no ip igmp query-max-response-time

Syntax Description

seconds	Maximum response time, in seconds, advertised in IGMP queries. Valid range is from 5–20.

Command Default

10 seconds.

Command Modes

Interface (VLAN) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

This command controls how much time the hosts have to answer an IGMP query message before the router deletes their group. Configuring a value of fewer than 10 seconds enables the router to prune groups faster.

The maximum query response time must be less than the query interval.

Example

The following example configures a maximum response time of 8 seconds:

```
nfvis(config-switch)# interface vlan 1
nfvis(config-switch-if)# ip igmp query-max-response-time 8
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

ip igmp query-interval

To configure the frequency at which the IGMP querier sends the IGMP host-query messages from an interface, use the **ip igmp query-interval** command in interface switch configuration mode. To restore the default IGMP query interval, use the **no** form of this command.

ip igmp query-interval *seconds*
no ip igmp query-interval

Syntax Description

seconds	Frequency, in seconds, at which the switch sends IGMP query messages from the interface. Valid range is from 30 to 18000.

Command Default

The default IGMP query interval is 125 seconds.

Command Modes

Interface (VLAN) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

The IGMP querier sends query-host messages to discover which multicast groups have members on the attached networks of the router.

The query interval must be bigger than the maximum query response time.

Example

The following example shows how to increase the frequency, at which the IGMP querier sends IGMP host-query messages, to 180 seconds:

```
nfvis(config-switch)# interface vlan 1
nfvis(config-switch-if)# ip igmp query-interval 180
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

ip igmp robustness

To configure the IGMP robustness variable, use the **ip igmp robustness** command in interface switch configuration mode. To restore the default value, use the **no** form of this command.

ip igmp robustness *count*
no ip igmp robustness

Syntax Description

count	The number of expected packets lost on a link. Valid range is from 1 to 7.

Command Default

The default value is 2.

Command Modes

Interface (VLAN) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example changes the value of the IGMP robustness variable to 3:

```
nfvis(config-switch)# interface vlan 20
nfvis(config-switch-if)# ip igmp robustness 3
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

IP Route Commands

ip route

To establish static routes, use the **ip route** command in switch configuration mode. To remove static routes, use the **no** form of this command.

ip route *prefix mask ip-address* [*metric-value*]
no ip route *prefix mask ip-address*

Syntax Description

prefix	Specifies the IP route prefix for the destination.
mask	Specifies the prefix mask for the destination.
ip-address	Specifies the IP address of the next hop that can be used to reach that network.
metric-value	Specifies the metric of the route. The default metric is 6. Valid range is from 1–255.

Command Default

No static routes are established.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example shows how to route packets for the network 209.165.201.2 to a router at 209.165.202.3:

```
nfvis(config-switch)# ip route 209.165.201.2 255.255.255.0 209.165.202.3 2
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

ip routing

To enable IP routing, use the **ip routing** command in switch configuration mode. To disable IP routing, use the **no** form of this command.

ip routing
no ip routing

Syntax Description

This command has no arguments or keywords.

Command Default

IP routing is disabled.

Command Modes

Switch configuration mode (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example enables IP Routing:

```
nfvis(config-switch)# ip routing
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

IP Addressing Commands

ip address

To define an IP address for an interface, use the **ip address** command in interface switch configuration mode. Use the **no** form of this command to remove an IP address definition.

ip address *ip-address mask*
no ip address

Syntax Description

ip-address	Specifies the IP address.
mask	Specifies the network mask of the IP address.

Command Default

No IP address is defined for interfaces.

Command Modes

Interface (VLAN) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

Use the **ip address** command to define a static IP address on an interface.

Defining a static IP address on an interface stops the DHCP client running on the interface and removes the IP address assigned by the DHCP client.

There is no default IP address assigned to default VLAN.

Example

The following example configures VLAN 20 with the IP address 209.165.201.2 and the subnet mask 255.255.255.0.

```
nfvis(config)# switch
nfvis(config-switch)# interface vlan 20
nfvis(config-switch-if)# ip address 209.165.201.2 255.255.255.0
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

ip address dhcp

To acquire the IP address for an Ethernet interface from the Dynamic Host Configuration Protocol (DHCP) server, use the **ip address dhcp** command in interface configuration mode. To release the acquired IP address, use the **no** form of this command.

ip address dhcp
no ip address dhcp

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Interface (VLAN) switch configuration (config-switch-if)

Command History

Release	Modification
3.7.1	This command was introduced.

Usage Guidelines

This command enables the DHCP client on the interface and removes all manually-configured addresses on the interface. The **no** form of this command disables the DHCP client on the interface. The default route (Default Gateway) received in DHCP Router option (Option 3) is assigned a metric of 8.

Example

The following example acquires an IP address for VLAN 100 from DHCP.

```
nfvis(config-switch)# interface vlan 100
nfvis(config-switch-if)# ip address dhcp
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

switch renew dhcp

To renew the IP address that was acquired from a DHCP server for a specific interface, use the **switch renew dhcp** command in privileged EXEC mode.

switch renew dhcp vlan *vlan-id*

Syntax Description

vlan *vlan-id*	Specifies the VLAN ID.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.7.1	This command was introduced.

Usage Guidelines

This command does not enable the DHCP client on an interface. If the DHCP client is not enabled on the specified interface, this command returns an error message. To enable the DHCP client on an interface, use the **ip address dhcp** command.

Example

The following example renews an IP address on VLAN 19 that was acquired from a DHCP server:

```
nfvis# switch renew dhcp vlan 19
```

ip default-gateway

To define a default gateway (device), use the **ip default-gateway** command in switch configuration mode. To delete the default gateway, use the **no** form of this command.

ip default-gateway *ip-address*
no ip default-gateway

Syntax Description

ip-address	Specifies the IP address for the default gateway.

Command Default

No default gateway is defined.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

None

Example

The following example defines the default gateway 209.165.201.1.

```
nfvis(config-switch)# ip default-gateway 209.165.201.1
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

show switch ip interface

To display the usability status of configured IP interfaces, use the **show switch ip interface** command in privileged EXEC mode.

show switch ip interface

Syntax Description

This command has no arguments.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.6.1	This command was introduced.

Example

The following is a sample output of the **show switch ip interface** command:

```
nfvis# show switch ip interface
                IF      ADMIN   OPER
IP ADDRESS      NAME    STATUS  STATUS  TYPE
-----------------------------------------------
172.25.213.10   VLAN2   Up      Up      Static
```

arp

To add a permanent entry to the Address Resolution Protocol (ARP) cache, use the **arp** command in switch configuration mode. To remove an entry from the ARP cache, use the **no** form of this command.

arp *ip-address* **vlan** *vlan-id* *mac-address*
no arp *ip-address*

Syntax Description

ip-address	Specifies the IP address or IP alias to map to the specified MAC address.
vlan *vlan-id*	Specifies the VLAN ID. You can enter a value from one of the following ranges: • 1 to 2349 • 2450 to 4093
mac-address	Specifies the MAC address to map to the specified IP address or IP alias.

Command Default

None

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.6.1	This command was introduced.

Usage Guidelines

The software uses ARP cache entries to translate 32-bit IP addresses into 48-bit hardware (MAC) addresses. Because most hosts support dynamic address resolution, static ARP cache entries generally do not need to be specified.

Example

The following example adds IP address 198.133.219.232 and MAC address 00:00:0c:40:0f:bc to the ARP table:

```
nfvis(config-switch)# arp 198.133.219.232 vlan 100 00:00:0c:40:0f:bc
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

arp timeout

To set the time interval during which an entry remains in the ARP cache, use the **arp timeout** command in switch configuration mode. To restore the default configuration, use the **no** form of this command.

arp timeout *seconds*
no arp timeout

Syntax Description

seconds	Specifies the time interval (in seconds) during which an entry remains in the ARP cache. Valid range is from 1to 40000000.

Command Default

The default ARP timeout is 60000 seconds, if IP Routing is enabled, and 300 seconds if IP Routing is disabled.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.6.1	This command was introduced.

Usage Guidelines

None

Example

The following example configures the ARP timeout to 12000 seconds:

```
nfvis(config-switch)# arp timeout 12000
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

switch clear arp-cache

To delete all dynamic entries from the ARP cache, use the **switch clear arp-cache** command in privileged EXEC mode.

switch clear arp-cache

Syntax Description

This command has no arguments.

Command Default

None

Command Modes

Privileged EXEC (#).

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example deletes all dynamic entries from the ARP cache:

```
nfvis# switch clear arp-cache
```

show switch arp table

To display entries in the Address Resolution Protocol (ARP) table, use the **show switch arp table** command in privileged EXEC mode.

show switch arp table

Syntax Description

This command does not have any arguments.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following is a sample output of the **show switch arp table** command:

```
nfvis# show switch arp table
IP ADDR      VLAN      INTERFACE  HW ADDRESS         STATUS
-------------------------------------------------------------
192.0.2.4  VLAN2363  te1/2      00:50:22:00:2A:A4  dynamic
192.0.2.5  VLAN2364  te1/0      00:a6:ca:d6:30:c3  dynamic
192.0.2.6  VLAN2365  te1/1      00:50:22:00:2A:A5  dynamic
```

Link Aggregation Control Protocol (LACP) Commands

lacp system-priority

To set the system priority, use the **lacp system-priority** command in switch configuration mode. To restore the default configuration, use the **no** form of this command.

lacp system-priority *value*
no lacp system-priority

Syntax Description

value	Specifies the system priority value. Valid range is from 1 to 65535.

Command Default

The default system priority is 1.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.6.1	This command was introduced.

Usage Guidelines

None

Example

The following example sets the system priority to 120:

```
nfvis(config-switch)# lacp system-priority 120
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

lacp port-priority

To set the physical port priority, use the **lacp port-priority** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

lacp port-priority *value*
no lacp port-priority

Syntax Description

value	Specifies the port priority value. Valid range is from 1 to 65535.

Command Default

The default port priority is 1.

Command Modes

Interface (Gigabit Ethernet) switch configuration (config-switch-if)

Command History

Release	Modification
3.6.1	This command was introduced.

Usage Guidelines

None

Example

The following example sets the priority of Gigabit Ethernet interface 1/0.

```
nfvis(config-switch)# interface gigabitEthernet 1/0
nfvis(config-switch-if)# lacp port-priority 247
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

lacp timeout

To assign an administrative LACP timeout to an interface, use the **lacp timeout** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

lacp timeout {**long** | **short**}
no lacp timeout

Syntax Description

long	Specifies the long timeout value.
short	Specifies the short timeout value.

Command Default

The default port timeout value is Long.

Command Modes

Interface (Gigabit Ethernet) switch configuration (config-switch-if)

Command History

Release	Modification
3.6.1	This command was introduced.

Usage Guidelines

None

Example

The following example assigns a long administrative LACP timeout to Gigabit Ethernet interface 1/0.

```
nfvis(config-switch)# interface gigabitEthernet 1/0
nfvis(config-switch-if)# lacp timeout long
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

Link Layer Discovery Protocol (LLDP) Commands

Link Layer Discovery Protocol (LLDP) Commands

Link Layer Discovery Protocol (LLDP), is a neighbor discovery protocol that is used for network devices to advertise information about themselves to other devices on the network. This protocol runs over the data-link layer, which allows two systems running different network layer protocols to learn about each other.

LLDP is unidirectional, operating only in an advertising mode. LLDP does not solicit information or monitor state changes between LLDP nodes. LLDP periodically sends advertisements to a constrained multicast address. Devices supporting LLDP can send information about themselves while they receive and record information about their neighbors. Additionally, devices can choose to turn off the send or receive functions independently. Advertisements are sent out and received on every active and enabled interface, allowing any device in a network to learn about all devices to which it is connected.

LLDP supports a set of attributes that it uses to discover neighbor devices. These attributes contain type, length, and value descriptions and are referred to as TLVs. LLDP supported devices can use TLVs to receive and send information to their neighbors. Details such as configuration information, device capabilities, and device identity can be advertised using this protocol.

lldp receive

To receive LLDP on an interface, use the **lldp receive** command. To stop receiving LLDP on an interface, use the no form of this command.

lldp receive
no lldp receive

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.9.1	This command was introduced.

Usage Guidelines

LLDP manages LAG ports individually. LLDP data received through LAG ports is stored individually per port.

LLDP operation on a port is not dependent on the STP state of a port. I.e. LLDP frames are received on blocked ports.

If a port is controlled by 802.1x, LLDP operates only if the port is authorized.

Example

The following example enables receiving LLDP on an interface:

```
nfvis(config-switch)# interface gigabitEthernet1/0
nfvis(config-switch-if)# lldp receive
nfvis(config-switch-if)# commit
```

lldp run

To enable LLDP, use the **lldp run** command. To disable LLDP, use the **no lldp run** command.

lldp run
no lldp run

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.9.1	This command was introduced.

Usage Guidelines

None

Example

The following example globally enables LLDP:

```
nfvis(config-switch)# lldp run
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

lldp timer

To specify how often the software sends LLDP updates, use the **lldp timer** command. To restore the default configuration, use the no form of this command.

lldp timer*seconds*
no lldp timer

Syntax Description

seconds	Specifies, in seconds, how often the software sends LLDP updates. Valid range is from 5 to 32768.

Command Default

30 seconds.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.9.1	This command was introduced.

Usage Guidelines

None.

Example

The following example sets the interval for sending LLDP updates to 135 seconds.

```
nfvis(config-switch-if)# lldp timer 135
nfvis(config-switch-if)# commit
```

lldp transmit

To enable transmitting LLDP on an interface use the **lldp transmit** command. Use the no form of this command to stop transmitting LLDP on an interface.

lldp transmit
no lldp transmit

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.9.1	This command was introduced.

Usage Guidelines

LLDP manages LAG ports individually. LLDP data received through LAG ports is stored individually per port.

LLDP operation on a port is not dependent on the STP state of a port. I.e. LLDP frames are received on blocked ports.

If a port is controlled by 802.1x, LLDP operates only if the port is authorized.

Example

The following example enables transmitting LLDP on an interface:

```
nfvis(config-switch)# interface gigabitEthernet1/0
nfvis(config-switch-if)# lldp transmit
nfvis(config-switch-if)# commit
```

show lldp neighbors

To display information about neighboring devices discovered using LLDP, use the **show lldp neighbors** command. The information can be displayed for all ports or for a specific port.

show lldpneighbors [**interface-id**]

Syntax Description

interface-id	Specifies the port ID.

Command Default

If no port ID is entered, the command displays information for all ports.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.9.1	This command was introduced.

Usage Guidelines

A TLV value that cannot be displayed as an ASCII string is displayed as an hexadecimal string.

Example

The following example displays information about LLDP neighbors:

```
nfvis# show switch lldp neighbors

SYSTEM
INDEX PORT DEVICE ID PORT ID NAME CAPABILITIES TTL
------------------------------------------------------------------------
1 gi1/1 00:1a:6c:81:f0:80 Gi1/0/31 SW-026 Bridge 93
2 gi1/6 2c:0b:e9:3c:89:00 Gi1/0/5 Switch Bridge 119
```

show lldp statistics

To display LLDP statistics on all ports or a specific port, use the **show lldp statistics** command.

show lldpstatistics { **interface-id** | **detailed** }

Syntax Description

interface-id	Specifies the port ID.
detailed	Displays information for non-present ports in addition to present ports.

Command Default

If no port ID is entered, the command displays information for all ports. If **detailed** is not used, only present ports are displayed.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.9.1	This command was introduced.

Usage Guidelines

None.

Example

The following example displays LLDP statistics:

```
nfvis# show switch lldp statistics
                                                                          RX
      TX              RX FRAMES           RX          TLVS            AGEOUTS
PORT  FRAMES  TOTAL   DISCARDED  ERRORS   DISCARDED   UNRECOGNIZED    TOTAL
-------------------------------------------------------------------------------
1/0   0       0       0          0        0           0               0
1/1   0       0       0          0        0           0               0
1/2   792     756     0          0        0           0               0
1/3   791     756     0          0        0           0               0
1/4   0       0       0          0        0           0               0
1/5   0       0       0          0        0           0               0
1/6   792     756     0          0        0           0               0
1/7   791     756     0          0        0           0               0
```

Monitor Commands

monitor session source

To create a SPAN or RSPAN source session, use the **monitor session source** command in switch configuration mode. To remove a source session, use the **no** form of this command.

monitor session *session_number* **source** {**interfaces gigabitEthernet** *interface-id* [**both** | **rx** | **tx**] | [**remote**] **vlan** *vlan-id*}
no monitor session *session_number* **source** {**interfaces gigabitEthernet** *interface-id* | [**remote**] **vlan** *vlan-id*}

Syntax Description

session_number	Specifies the session number identified with the SPAN or RSPAN session. Valid range is from 1 to 7.
interfaces gigabitEthernet *interface-id*	Specifies the Gigabit Ethernet port for a SPAN session.
both, **rx**, **tx**	Specifies the traffic direction to monitor. If you do not specify a traffic direction, the source interface sends both transmitted and received traffic.
remote	Specifies remote VLAN for an RSPAN session.
vlan *vlan-id*	Specifies the VLAN for a SPAN or an RSPAN session. Only value of 1 is allowed for the *session_number* parameter.

Command Default

No SPAN sessions are configured.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.6.1	This command was introduced.

Usage Guidelines

To create a SPAN source session to monitor the traffic that enters or leaves a source port, use the **monitor session** *session_number* **source interfaces gigabitEthernet** *interface-id* [**both** | **rx** | **tx**] command . To create a SPAN source session to monitor the traffic that is bridged into a source VLAN, use the **monitor session** *session_number* **source vlan** *vlan-id* command.

A session can have up to eight source ports and one destination port with the same session number. A source port cannot be a destination port. Each **monitor session** *session_number* **source** command defines only one Gigabit Ethernet port or VLAN. If a packet is mirrored by a port-based ingress mirroring mechanism along with any other ingress mirroring mechanism, the session with the higher session number is selected.

A session cannot have both SPAN and RSPAN source ports. All source ports in a session must be of same type, that is, either SPAN or RSPAN.

Use the **no monitor session** *session_number* **source** {**interfaces gigabitEthernet** *interface-id* | **vlan** *vlan-id*} command to remove one source port of a source session. Use the **no monitor session** *session_number* **source** command to remove all sources ports of a source session. To change a source port, you must first remove it and then create it again as shown in Example 2.

Example 1

The following example configures a SPAN session consisting of three source ports and one destination port. The first source session copies traffic for both directions from the source port `1/1`, the second source session copies the bridged traffic from VLAN 100, and the third source session copies the traffic received on the source port `1/2`. The port `1/3` is configured as the destination port.

```
nfvis(config-switch)# monitor session 1 source interfaces gigabitEthernet 1/1 both
nfvis(config-switch)# monitor session 1 source vlan 100
nfvis(config-switch)# monitor session 1 source interfaces gigabitEthernet 1/2 rx
nfvis(config-switch)# monitor session 1 destination interfaces gigabitEthernet 1/3
```

Example 2

The following example shows how to change a source session.

```
nfvis(config-switch)# monitor session 1 source interfaces gigabitEthernet 1/3 tx
nfvis(config-switch)# commit
nfvis(config-switch)# no monitor session 1 source interfaces gigabitEthernet 1/3 tx
nfvis(config-switch)# commit
nfvis(config-switch)# monitor session 1 source interfaces gigabitEthernet 1/3 rx
nfvis(config-switch)# commit
```

monitor session destination

To create a SPAN or RSPAN destination session, use the **monitor session destination** command in switch configuration mode. To remove a destination session, use the **no** form of this command.

monitor session *session_number* **destination** {**interfaces gigabitEthernet** *interface-id* [**network**] | **remote vlan** *vlan-id* **reflector-port gigabitEthernet** *interface-id* **network**}
no monitor session *session_number* **destination**

Syntax Description

session_number	Specifies the session number identified with the SPAN or flow mirror session. Valid range is from 1 to 7.
interfaces gigabitEthernet *interface-id*	Specifies the Gigabit Ethernet port for the SPAN or flow mirror session.
network	Specifies that the destination port acts also as a network port.
remote vlan *vlan-id*	Specifies the remote VLAN for an RSPAN session.
reflector-port gigabitEthernet *interface-id*	Specifies the reflector Gigabit Ethernet port that will flood the RSPAN traffic onto the RSPAN VLAN.

Command Default

No SPAN sessions are configured.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.6.1	This command was introduced.

Usage Guidelines

Use the **monitor session** *session_number* **destination interfaces gigabitEthernet** *interface-id* command to create a SPAN session to copy traffic to a destination port.

If the **network** keyword is not defined, only mirrored traffic is sent on a destination port. All input traffic is discarded and a value of `DOWN` is advertised as its operational status to all applications running on it. 802.1x cannot be enabled on a destination port configured without the **network** keyword.

A destination port cannot be a source port. A port cannot be configured as the destination port with the **network** keyword if it belongs to the source VLAN. Mirrored traffic is sent to queue number 1 of the destination port.

Example

The following example configures a SPAN session consisting of three source ports and one destination port. The first source session copies traffic for both directions from the source port `1/1`, the second source session copies the bridged traffic from VLAN 100, and the third source session copies the traffic received on the source port `1/2`. The port `1/3` is configured as the destination port.

```
nfvis(config-switch)# monitor session 1 source interfaces gigabitEthernet 1/1 both
nfvis(config-switch)# monitor session 1 source vlan 100
```

```
nfvis(config-switch)# monitor session 1 source interfaces gigabitEthernet 1/2 rx
nfvis(config-switch)# monitor session 1 destination interfaces gigabitEthernet 1/3
```

Port Channel Commands

port-channel load-balance

To configure load balancing for port channels, use the **port-channel load-balance** command in switch configuration mode. To restore the default configuration, use the **no** form of this command.

port-channel load-balance {**src-dst-mac** | **src-dst-mac-ip**}
no port-channel load-balance

Syntax Description

src-dst-mac	Enables load balancing based on the source and destination MAC addresses.
src-dst-mac-ip	Enables load balancing based on the source and destination MAC and IP addresses.

Command Default

None

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.6.1	This command was introduced.

Example

The following example enables load balancing based on the source and destination MAC addresses:

```
nfvis(config-switch)# port-channel load-balance src-dst-mac
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

Power over Ethernet Commands

power inline

To configure the inline power administrative mode on a Gigabit Ethernet interface, use the **power inline** command in interface switch configuration mode. To disable the inline power administrative mode, use the **no** form of the command.

power inline {**auto** | **never**}
no power inline

Syntax Description

auto	Turns on the device discovery protocol and supplies power to the device.
never	Turns off the device discovery protocol and stops supplying power to the device.

Command Default

The device discovery protocol is turned on and power is supplies to the device.

Command Modes

Interface switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

None

Example

The following example shows how to configure the inline power administrative mode on a Gigabit Ethernet interface:

```
nfvis(config-switch)# interface gigabitEthernet 1/0
nfvis(config-switch-if)# power inline auto
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

power inline four-pair

To enable the spare pair to supply power, use the **power inline four-pair** command in interface switch configuration mode. To cancel the configuration, use the **no** form of the command.

power inline four-pair forced
no power inline four-pair

Syntax Description

forced	Forces the spare pair to supply power. It uses 60W PoE.

Command Default

None

Command Modes

Interface (Gigabit Ethernet) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

This command should only be used for ports that are connected to devices that do not support the LLDP protocol or the new 4-wire power through MDI TLV (like UPOE splitter). This command overrides any port mode or port limit configuration.

Example

The following example shows how to enable the forced power supply with the spare pair:

```
nfvis(config-switch)# interface gigabitEthernet 1/0
nfvis(config-switch-if)# power inline four-pair forced
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

power inline limit-mode

To configure the inline power administrative mode, use the **power inline limit-mode** command in switch configuration mode. To restore the default configuration, use the **no** form of this command.

power inline limit-mode {**class** | **port**}
no power inline limit-mode

Syntax Description

class	Specifies the class power limit.
port	Specifies the port power limit.

Command Default

The default mode is **class**.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

All PoE commands are supported only on Cisco ENCS 5408 and Cisco ENCS 5412 devices.

Example

The following example shows how to configure inline power on the Cisco ENCS:

```
nfvis(config-switch)# power inline limit-mode class
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

power inline limit

To configure the power limit per port, use the **power inline limit** command in interface switch configuration mode. To cancel the power limit configuration, use the **no** form of the command.

power inline limit *value*
no power inline limit

Syntax Description

value	Specifies the power limit for the port in milliwatt. Valid range is from 0 to 60000. The default value is 30W.

Command Default

None

Command Modes

Interface (Gigabit Ethernet) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

The operational power limit is the minimum of the configured power limit value and the maximum power capability on port. For example, if the configured value is higher than 15.4W on a PoE port, the operational power limit is 15.4W.

Example

The following example shows how to configure power limit on the Gigabit Ethernet interface 1/0:

```
nfvis(config-switch)# interface gigabitEthernet 1/0
nfvis(config-switch-if)# power inline limit 30000
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

power inline powered-device

To add a description of the device type, use the **power inline powered-device** command in interface switch configuration mode. To remove the description, use the **no** form of the command.

power inline powered-device *word*
no power inline powered-device

Syntax Description

word	Describes the device type.

Command Default

None

Command Modes

Interface (Gigabit Ethernet) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example shows how to add a description for the device:

```
nfvis(config-switch)# interface gigabitEthernet 1/0
nfvis(config-switch-if)# power inline powered-device ip-phone
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

power inline priority

To configure the interface inline power management priority, use the **power inline priority** command in interface switch configuration mode. To restore the default configuration, use the **no** form of the command.

power inline priority {**critical** | **high** | **low**}
no power inline priority

Syntax Description

critical	Specifies that the device operation is critical.
high	Specifies that the device operation is high priority.
low	Specifies that the device operation is low priority.

Command Default

The inline power management priority is set to low priority

Command Modes

Interface (Gigabit Ethernet) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example shows how to configure the interface inline power management priority:

```
nfvis(config-switch)# interface gigabitEthernet 1/0
nfvis(config-switch-if)# power inline priority high
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

show switch power inline

To display information about the inline power for all interfaces, use the **show switch power inline** command in privileged EXEC mode.

show switch power inline [{**consumed-power** | **nominal-power** | **power-limit-mode**}]

Syntax Description

consumed-power	Displays total consumed power.
nominal-power	Displays total nominal power.
power-limit-mode	Displays inline power administrative mode.

Command Default

Inline power information for all interfaces is displayed.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following is a sample output of the **show switch power inline** command in privileged EXEC mode:

```
nfvis# show switch power inline
power inline power-limit-mode "Class based"
power inline nominal-power 200
power inline consumed-power 10
```

show switch interface inline-status

To display the inline power status of all interfaces or a specific interface, use the **show switch interface inline-status** command in privileged EXEC mode.

show switch interface inline-status [{**gigabitEthernet** *interface-id*}]

Syntax Description

gigabitEthernet *interface-id*	Specifies the Gigabit Ethernet interface ID.

Command Default

Displays the inline power status of all interfaces.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

For verification and the command output display, use the **show switch interface inline-status** command. For debugging, use the **switch show interface inline-status** command.

Example

The following command output displays the inline power status of all interfaces:

```
nfvis# show switch interface inline-status
PORT  ADMIN  OPER       POWER  CLASS  DEVICE  PRIORITY
-------------------------------------------------------
1/0   auto   Searching  0.0    0      None    low
1/1   auto   Searching  0.0    0      None    low
1/2   auto   Searching  0.0    0      None    low
1/3   auto   Searching  0.0    0      None    low
1/4   auto   Searching  0.0    0      None    low
1/5   auto   On         6.5    4      None    low
1/6   auto   Searching  0.0    0      None    low
1/7   auto   Searching  0.0    0      None    low
```

QoS Commands

qos cos

To define the default CoS value of a port, use the **qos cos** command in the interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

qos cos *default-cos*
no qos cos

Syntax Description

default-cos	Specifies the default CoS value (VPT value) of the port. If the port is trusted and the packet is untagged, the default CoS value become the CoS value. Valid range is from 0 to 7.

Command Default

The default CoS value of a port is 0.

Command Modes

Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

Use the default CoS value to assign a CoS value to all the untagged packets entering the interface.

Example

The following example defines the default CoS value of Gigabit Ethernet interface 1/1 as 3.

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# qos cos 3
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

qos dscp-mutation

To apply the DSCP mutation map to system DSCP trusted ports, use the **qos dscp-mutation** command in switch configuration mode. To restore the trusted port with no DSCP mutation, use the **no** form of this command.

qos dscp-mutation
no qos dscp-mutation

Syntax Description

This command has no arguments.

Command Default

Disabled

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

Apply the DSCP-to-DSCP-mutation map to a port at the boundary of a Quality of Service (QoS) administrative domain. If two QoS domains have different DSCP definitions, use the DSCP-to-DSCP-mutation map to translate a set of DSCP values to match the definition of another domain. Apply the map to ingress and to DSCP-trusted ports only. Applying this map to a port causes IP packets to be rewritten with newly mapped DSCP values at the ingress ports. If applying the DSCP mutation map to an untrusted port, to class of service (CoS), or to an IP-precedence trusted port. Global trust mode must be DSCP or CoS-DSCP. In advanced CoS mode, ports must be trusted.

Example

The following example applies the DSCP Mutation map to system DSCP trusted ports.

```
nfvis(config-switch)# qos dscp-mutation
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

qos map dscp-mutation

To configure the DSCP to DSCP mutation table, use the **qos map dscp-mutation** command in switch configuration mode. To restore the default configuration, use the **no** form of this command.

qos map dscp-mutation *in-dscp out-dscp*
no qos map dscp-mutation *in-dscp out-dscp*

Syntax Description

in-dscp	Specify the input dscp value. Valid range is from 0 to 63.
out-dscp	Specify the output dscp value. Valid range is from 0 to 63.

Command Default

The default map is the Null map, which means that each incoming DSCP value is mapped to the same DSCP value.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

This is the only map that is not globally configured. It is possible to have several maps and assign each one to a different port.

Example

The following example changes DSCP value 6 to DSCP mutation map value 63.

```
nfvis(config-switch)# qos map dscp-mutation 6 63
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

qos map dscp-queue

To configure a DSCP value to a queue, use the **qos map dscp-queue** command in switch configuration mode. To restore the default configuration, use the **no** form of this command.

qos map dscp-queue *dscp-value queue-id*
no qos map dscp-queue [*dscp-value*]

Syntax Description

dscp-value	Specifies the dscp value.
queue-id	Specifies the queue number to which the DSCP value is to be mapped.

Command Default

The queue to cos and DSCP mapping is given in the table below:

CoS	Queue	DSCP	Queue
0	1	0-8	1
1	1	9-15	2
2	2	16, 24, 40, 48-63	6
3	5	17-23	3
4	4	25-31	4
5	7	32, 41-47	7
6	7	33-39	5
7	6		

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example maps DSCP value 40 to queue 1.

```
nfvis(config-switch)# qos map dscp-queue 40 1
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

qos map policed-dscp

To configure the policed-DSCP map for remarking purposes, use the **qos map policed-dscp** command in switch configuration mode. To restore the default configuration, use the **no** form of this command.

qos map policed-dscp *dscp-value dscp-mark-down*
no qos map policed-dscp [*dscp-value*]

Syntax Description

dscp-value	Specifies a dscp value. Valid range is from 0 to 63.
dscp-mark-down	Specifies the DSCP value to mark down. Valid range is from 0 to 63.

Command Default

The default map is the Null map, which means that each incoming DSCP value is mapped to the same DSCP value.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

The original DSCP value and the policed-DSCP value must be mapped to the same queue in order to prevent reordering.

Example

The following example marks incoming DSCP value 3 as DSCP value 5 on the policed-DSCP map.

```
nfvis(config-switch)# qos map policed-dscp 3 5
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

qos port

To configure the port trust mode, use the **qos port** command in switch configuration mode. To restore the default configuration, use the **no** form of this command.

qos port {**ports-not-trusted** | **ports-trusted**}
no qos port

Syntax Description

ports-not-trusted	Indicates that the packets, which are not classified by policy map rules to a QoS action, are mapped to egress queue 0 unless a policy map action explicitly specifies another trust/set action.
ports-trusted	Indicates that the packets, which are not classified by policy map rules to a QoS action, are mapped to an egress queue based on the packet's fields, unless a policy map action explicitly specifies another trust/set action. Use the **qos trust cos-dhcp** command to specify the trust mode.

Command Default

ports-not-trusted

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

None

Example

The following example configures the port trust mode.

```
nfvis(config-switch)# qos port ports-trusted
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

qos trust cos-dscp

To configure the system to the cos-dscp trust mode, use the **qos trust cos-dscp** command in switch configuration mode. To return to the default configuration, use the **no** form of this command.

qos trust cos-dscp
no qos trust cos-dscp

Syntax Description

This command has no arguments.

Command Default

The default trust mode is dscp.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

This command can be used only in QoS basic mode.

Packets entering a QoS domain are classified at its edge. When the packets are classified at the edge, the switch port within the QoS domain can be configured to the trusted state because there is no need to classify the packets at every switch within the domain.

Example

The following example configures the system to the cos-dscp trust state.

```
nfvis(config-switch)# qos trust cos-dscp
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

RADIUS Commands

radius-server deadtime

To configure how long unavailable RADIUS servers are skipped over by transaction requests, use the **radius-server deadtime** command in switch configuration mode. This improves RADIUS response time when servers are unavailable. To restore the default configuration, use the **no** form of this command.

radius-server deadtime *deadtime*
no radius-server deadtime

Syntax Description

deadtime	Specifies the time interval in minutes, during which a RADIUS server is skipped over by transaction requests. Valid range is from 0 to 2000.

Command Default

The default deadtime interval is 0.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example sets the deadtime of all RADIUS servers to 10 minutes.

```
nfvis(config-switch)# radius-server deadtime 10
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

radius-server host

To configure a RADIUS server host, use the **radius-server host** command in switch configuration mode. To delete the specified RADIUS server host, use the **no** form of the command.

radius-server host {*ip-address* | *hostname*} [**acct-port** *UDP-port-number*] [**auth-port** *UDP-port-number*] [**deadtime** *deadtime*] [**key** *key-string*] [**priority** *priority*] [**retransmit** *retries*]
no radius-server host

Syntax Description

ip-address	Specifies the RADIUS server host IP address. The IP address can be an IPv4, IPv6 or IPv6z address.
hostname	Specifies the RADIUS server host name. Translation to IPv4 addresses only is supported. (Length: 1–158 characters. Maximum label length of each part of the hostname: 63 characters)
acct-port *UDP-port-number*	(Optional) Specify the UDP port number for accounting requests. If the port number is set to 0, the host is not used for authentication. If unspecified, the port number defaults to 1813.
auth-port *UDP-port-number*	(Optional) Specify the UDP port number for authentication requests. If set to 0, the host is not used for authentication . If unspecified, the port number defaults to 1812.
deadtime *deadtime*	(Optional) Specify time, in minutes, for which a RADIUS server is skipped over by transaction requests. Range: 1-2000
key *key-string*	(Optional) Specifies the authentication and encryption key (per-server encryption key) for all RADIUS communications between the device and the RADIUS server. This key must match the encryption used on the RADIUS daemon. Length: 0–128 characters. To specify an empty string, enter "". If this parameter is omitted, the globally-configured radius key will be used.
priority *priority*	(Optional) Specifies the order in which servers are used, where 0 is the highest priority. Range: 0-65535.
retransmit *retries*	(Optional) Specify the number of retries to the active server (overrides default). If no retransmit value is specified, the global value is used. Range: 0-15.

Command Default

If **retransmit** is not specified, the global value set in the **radius-server retransmit** command is used.

If **key** is not specified, the global value set in the **radius-server key** command is used.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

To specify multiple hosts, use this command for each host.

Example

The following example specifies a RADIUS server host with the IP address 172.29.39.46 and authentication request port number 20.

```
nfvis(config-switch)# radius-server host 172.29.39.46 auth-port 20
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

radius-server key

To set the authentication key for RADIUS communications between the device and the RADIUS daemon, use the **radius-server key** command in switch configuration mode. To restore the default configuration, use the **no** form of this command

radius-server key *key-string*
no radius-server key

Syntax Description

key-string	Specifies the authentication and encryption key for all RADIUS communication between the device and the RADIUS server. This key must match the encryption used on the RADIUS daemon. Range: 0 to 128 characters.

Command Default

The key-string is an empty string.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example defines the authentication key for all RADIUS communication between the device and the RADIUS daemon.

```
nfvis(config-switch)# radius-server key enterprise-server
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

radius-server retransmit

To specify the number of times the software searches the list of RADIUS server hosts, use the **radius-server retransmit** command in switch configuration mode. To restore the default configuration, use the **no** form of this command.

radius-server retransmit *retries*
no radius-server retransmit

Syntax Description

retries	Specifies the number of retries for a transaction. Valid range is from 1 to 15.

Command Default

The software searches the list of RADIUS server hosts 3 times.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example configures the number of times the software searches all RADIUS server hosts to 5.

```
nfvis(config-switch)# radius-server retransmit 5
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

radius-server timeout

To set the number of retries for a transaction, use the **radius-server timeout** command in switch configuration mode. To restore the default configuration, use the **no** form of this command

radius-server timeout *timeout-tries*
no radius-server timeout *timeout-tries*

Syntax Description

timeout-tries	Specify the number of retries for a transaction. Valid range is from 1 to 15.

Command Default

The default value for *timeout-tries* is 3.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example sets the number of retries for a transaction to 5.

```
nfvis(config-switch)# radius-server timeout 5
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

ip radius source-interface

To use the IPv4 address of the specified source interface as the Source IPv4 address for communication with IPv4 RADIUS servers, use the **ip radius source-interface** command in switch configuration mode. To restore the default configuration, use the **no** form of the command.

ip radius source-interface *interface-id*
no ip radius source-interface

Syntax Description

interface-id	Specifies the source interface.

Command Default

The source IPv4 address is the IPv4 address defined on the outgoing interface and belonging to next hop IPv4 subnet.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.6.1	This command was introduced.

Usage Guidelines

If the source interface is the outgoing interface, the interface IP address belonging to next hop IPv4 subnet is applied.

If the source interface is not the outgoing interface, the minimal IPv4 address defined on the source interface is applied.

Example

The following example configures the VLAN 10 as the source interface.

```
nfvis(config-switch)# ip radius source-interface vlan 100
```

show switch radius-server

To display the RADIUS server configuration, use the **show switch radius-server** command in privileged EXEC mode.

show switch radius-server [**configuration** {**global** | **host**}]

Syntax Description

configuration	Specifies the mode for the RADIUS server configuration information.
global	Displays the global configuration information about the RADIUS server.
host	Displays the RADIUS server host information.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.6.1	This command was introduced.

Usage Guidelines

None

Example

The following is a sample output of the **show switch radius-server** command that displays the RADIUS server configuration:

```
nfvis# show switch radius-server
radius-server configuration global key None
radius-server configuration global timeout 3
radius-server configuration global deadtime 0
radius-server configuration global retransmit 3
radius-server configuration global source-ipv4-intf none
```

Spanning Tree Commands

spanning-tree bpdu (Global)

To define Bridge Protocol Data Unit (BPDU) handling when the spanning tree is disabled globally or on a single interface, use the **spanning-tree bpdu** command in switch configuration mode. To restore the default configuration, use the **no** form of this command.

spanning-tree bpdu {**filtering** | **flooding**}
no spanning-tree bpdu

Syntax Description

filtering	Specifies that BPDU packets are filtered when the spanning tree is disabled on an interface.
flooding	Specifies that untagged BPDU packets are flooded unconditionally (without applying VLAN rules) to all ports where spanning tree is disabled and the BPDU handling mode is flooding. Tagged BPDU packets are filtered.

Command Default

The default setting is flooding.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

The filtering and flooding modes are relevant when the spanning tree is disabled globally or on a single interface.

Example

The following example sets the BPDU packet handling mode to flooding when the spanning tree is disabled on an interface:

```
nfvis(config-switch)# spanning-tree bpdu flooding
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

spanning-tree forward-time

To configure the spanning-tree bridge forward time, which is the amount of time a port remains in the listening and learning states before entering the forwarding state, use the **spanning-tree forward-time** command in switch configuration mode. To restore the default configuration, use the **no** form of this command.

spanning-tree forward-time *seconds*
no spanning-tree forward-time

Syntax Description

seconds	Specifies the spanning-tree forward time in seconds. Valid range is from 4 to 30.

Command Default

15 seconds

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

When configuring the forwarding time, the following relationship should be maintained:

2 * (Forward-Time - 1) >= Max-Age >= 2 * (Hello-Time + 1)

Example

The following example configures the spanning tree bridge forwarding time to 25 seconds:

```
nfvis(config-switch)# spanning-tree forward-time 25
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

spanning-tree hello-time

To configure how often the device broadcasts Hello messages to other devices, use the **spanning-tree hello-time** command in switch configuration mode. To restore the default configuration, use the **no** form of this command

spanning-tree hello-time *seconds*
no spanning-tree hello-time

Syntax Description

seconds	Specifies the spanning-tree Hello time in seconds. Range is from 1 to 10.

Command Default

2 seconds

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

When configuring the Hello time, the following relationship should be maintained:

Max-Age >= 2*(Hello-Time + 1)

Example

The following example configures the spanning-tree bridge hello time to 5 seconds:

```
nfvis(config-switch)# spanning-tree hello-time 5
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

spanning-tree loopback-guard

To shut down an interface if it receives a loopback BPDU, use the **spanning-tree loopback-guard** command in switch configuration mode. To return to the default setting, use the **no** form of this command.

spanning-tree loopback-guard
no spanning-tree loopback-guard

Syntax Description

This command has no arguments.

Command Default

None

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

This enables shutting down all interfaces if a loopback BPDU is received on it.

Example

```
nfvis(config-switch)# spanning-tree loopback-guard
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

spanning-tree max-age

To configure the STP maximum age, use the **spanning-tree max-age** command in switch configuration mode. To restore the default configuration, use the **no** form of this command.

spanning-tree max-age *seconds*
no spanning-tree max-age

Syntax Description

seconds	Specifies the spanning-tree bridge maximum age in seconds. Valid range is from 6 to 40

Command Default

20 seconds.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

When configuring the maximum age, the following relationships should be maintained:

2*(Forward-Time - 1) >= Max-Age

Max-Age >= 2*(Hello-Time + 1)

Example

The following example sets the spanning-tree bridge maximum age to 10 seconds.

```
nfvis(config-switch)# spanning-tree max-age 10
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

spanning-tree mode

To select which Spanning Tree Protocol (STP) protocol to run, use the **spanning-tree mode** command in switch configuration mode. To restore the default configuration, use the **no** form of this command.

spanning-tree mode {**stp** | **rstp** | **mst**}
no spanning-tree mode

Syntax Description

stp	Specifies that STP is enabled.
rstp	Specifies that the Rapid STP is enabled.
mst	Specifies that the Multiple STP is enabled.

Command Default

The default is **rstp**.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

In RSTP mode, the device uses STP when the neighbor device uses STP.

In MSTP mode, the device uses RSTP when the neighbor device uses RSTP, and uses STP when the neighbor device uses STP.

Example

The following example enables STP:

```
nfvis(config-switch)# spanning-tree mode stp
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

Example

The following example enables MST:

```
nfvis(config-switch)# spanning-tree mode mst
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

spanning-tree mst configuration

Use the **spanning-tree mst configuration** command to enable configuring an MST region by entering the MST mode.

spanning-tree mst configuration

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.8.1	This command was introduced.

Usage Guidelines

For two or more switches to be in the same MST region, they must contain the same VLAN mapping, the same configuration revision number, and the same name.

Example

The following example configures an MST region.

```
nfvis(config-switch)# spanning-tree mst configuration
nfvis(config-switch-mst)# instance 1 vlan 15
nfvis(config-switch-mst)# name mst_test
nfvis(config-switch-mst)# revision 2
nfvis(config-switch-mst)# commit
```

spanning-tree mst max-hops

Use the **spanning-tree mst max-hops** command to configure the number of hops in an MST region before the BDPU is discarded and the port information is aged out. Use the no form of this command to restore the default configuration.

spanning-tree mst max-hops *hop-count*
nospanning-tree mst max-hops

Syntax Description

hop-count	Specifies the number of hops in an MST region before the BDPU is discarded. Valid range is from 1 to 40.

Command Default

The default number of hops is 20.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.8.1	This command was introduced.

Example

The following example configures the maximum number of hops that a packet travels in an MST region before it is discarded to 10.

```
nfvis(config-switch)# spanning-tree mst max-hops 10
nfvis(config-switch)# commit
```

spanning-tree mst port-priority

Use the **spanning-tree mst port-priority** command to configure the priority of a port. Use the no form of this command to restore the default configuration.

spanning-tree mst *instance-id* **port-priority** *priority*
nospanning-tree mst *instance-id* **port-priority**

Syntax Description

instance-id	Specifies the spanning tree instance ID. Valid range is from 1 to 15.
priority	Specifies the port priority. Valid range is from 0 to 240 in multiples of 16.

Command Default

The default port priority is 128.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.8.1	This command was introduced.

Usage Guidelines

The priority value must be a multiple of 16.

Example

The following example configures the port priority:

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# spanning-tree mst 1 port-priority 96
nfvis(config-switch-if)# spanning-tree mst 1 cost 2
nfvis(config-switch-if)# commit
```

spanning-tree pathcost method

To set the default path cost method, use the **spanning-tree pathcost** method in switch configuration mode. To return to the default configuration, use the **no** form of this command.

spanning-tree pathcost method {**long** | **short**}
no spanning-tree pathcost method

Syntax Description

long	Use 32-bit based values for default port path costs.
short	Use 16-bit based values for default port path costs.

Command Default

Long path cost method.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

This command applies to all the spanning tree instances on the switch.

- If the short method is selected, the switch calculates the default cost as 100.
- If the long method is selected, the switch calculates the default cost as 20000.

Example

The following example sets the default path cost method to Long.

```
nfvis(config-switch)# spanning-tree pathcost method long
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

spanning-tree priority

To configure the device STP priority, which is used to determine which bridge is selected as the root bridge, use the **spanning-tree priority** command in switch configuration mode. To restore the default device spanning-tree priority, use the **no** form of this command

spanning-tree priority *priority*
no spanning-tree priority

Syntax Description

priority	Specifies the bridge priority. Valid range is from 0 to 61440.

Command Default

The default priority is 32768.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

The priority value must be a multiple of 4096.

The switch with the lowest priority is the root of the spanning tree. When more than one switch has the lowest priority, the switch with the lowest MAC address is selected as the root.

Example

The following example configures the spanning-tree priority to 12288:

```
nfvis(config-switch)# spanning-tree priority 12288
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

spanning-tree enable

To enable the spanning-tree functionality, use the **spanning-tree enable** command in switch configuration mode. To disable the spanning-tree functionality, use the **no** form of this command.

spanning-tree enable
no spanning-tree enable

Syntax Description

This command has no arguments.

Command Default

Spanning-tree is enabled.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example enables the spanning-tree functionality:

```
nfvis(config-switch)# spanning-tree enable
nfvis(config-switch)# commit
nfvis(config-switch)# end
```

spanning-tree bpdu (Interface)

To define Bridge Protocol Data Unit (BPDU) handling when the spanning tree is disabled on a single interface, use the **spanning-tree bpdu** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

spanning-tree bpdu {**filtering** | **flooding**}
no spanning-tree bpdu

Syntax Description

filtering	Specifies that BPDU packets are filtered when the spanning tree is disabled on an interface.
flooding	Specifies that untagged BPDU packets are flooded unconditionally (without applying VLAN rules) to all ports with the spanning tree disabled and the BPDU handling mode of flooding. Tagged BPDU packets are filtered.

Command Default

The **spanning-tree bpdu (Global)** command determines the default configuration.

Command Modes

Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

The filtering and flooding modes are relevant when the spanning tree is disabled globally or on a single interface.

Example

The following example defines the BPDU packet as flooding when the spanning tree is disabled on Gigabit Ethernet interface 1/1:

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# spanning-tree bpdu flooding
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

spanning-tree bpduguard

To shut down an interface when it receives a Bridge Protocol Data Unit (BPDU), use the **spanning-tree bpduguard** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

spanning-tree bpduguard {**enable** | **disable**}
no spanning-tree bpduguard

Syntax Description

enable	Enables BPDU Guard.
disable	Disables BPDU Guard.

Command Default

BPDU Guard is disabled.

Command Modes

Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

BPDU guard can be enabled when the spanning tree is enabled (useful when the port is in the PortFast mode) or disabled.

Example

The following example shuts down the Gigabit Ethernet interface 1/1 when it receives a BPDU.

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# spanning-tree bpduguard enable
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

spanning-tree cost

To configure the spanning-tree path cost for a port, use the **spanning-tree cost** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

spanning-tree cost *cost*
no spanning-tree cost

Syntax Description

cost	Specifies the port path cost. Valid range is from 1 to 200000000.

Command Default

Default path cost is determined by port speed and path cost method (long or short).

Table 3:

Interface	Long	Short
Port-channel	20,000	4
Gigabit Ethernet (1000 Mbps)	20,000	4
Ethernet (10 Mbps)	2,000,000	100

Command Modes

Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example configures the spanning-tree cost on Gigabit Ethernet interface 1/1 to 35000.

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# spanning-tree cost 35000
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

spanning-tree guard root

To enable root guard on all spanning-tree instances on an interface, use the **spanning-tree guard root** command in interface switch configuration mode. Root guard prevents the interface from becoming the root port of the device. Use the **no** form of this command to disable the root guard on the interface.

spanning-tree guard root
no spanning-tree guard root

Syntax Description

This command has no arguments.

Command Default

Root guard is disabled.

Command Modes

Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

Root guard can be enabled when the device operates in any mode (STP, RSTP, and MSTP).

When root guard is enabled, the port changes to the alternate state if the spanning-tree calculations select the port as the root port.

Example

The following example prevents Gigabit Ethernet interface 1/1 from being the root port of the device.

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# spanning-tree guard root
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

spanning-tree link-type

To override the default link-type setting determined by the port duplex mode, and enable RSTP transitions to the Forwarding state, use the **spanning-tree link-type** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

spanning-tree link-type {**point-to-point** | **shared**}
no spanning-tree link-type

Syntax Description

point-to-point	Specifies that the port link type is point-to-point.
shared	Specifies that the port link type is shared.

Command Default

The device derives the port link type from the duplex mode. A full-duplex port is considered a point-to-point link and a half-duplex port is considered a shared link.

Command Modes

Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example enables shared spanning-tree on Gigabit Ethernet interface 1/1.

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# spanning-tree link-type shared
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

spanning-tree port-priority

To configure the port priority, use the **spanning-tree port-priority** command in interface switch configuration mode. To restore the default configuration, use the **no** form of this command.

spanning-tree port-priority *priority*
no spanning-tree port-priority

Syntax Description

priority	Specifies the port priority. Valid range is from 0 to 240.

Command Default

The default port priority is 128.

Command Modes

Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

The priority value must be a multiple of 16.

Example

The following example configures the spanning priority on Gigabit Ethernet interface 1/1 to 96.

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# spanning-tree port-priority 96
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

spanning-tree portfast

To enable the PortFast mode, use the **spanning-tree portfast** command in interface switch configuration mode. In PortFast mode, the interface is immediately put into the forwarding state upon linkup, without waiting for the standard forward time delay. To disable the PortFast mode, use the **no** form of this command.

spanning-tree portfast {**auto** | **enable**}
no spanning-tree portfast

Syntax Description

auto	Specifies that the software waits for 3 seconds (with no BPDUs received on the interface) before putting the interface into the PortFast mode.
enable	Enables an interface to move directly to forwarding on linkup.

Command Default

PortFast mode is disabled.

Command Modes

Interface (Gigabit Ethernet, Port Channel) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example enables the PortFast mode on Gigabit Ethernet interface 1/1:

```
nfvis(config-switch)# interface gigabitEthernet 1/1
nfvis(config-switch-if)# spanning-tree portfast enable
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

show spanning-tree

To display the spanning-tree configuration, use the **show switch spanning-tree** command in privileged EXEC mode.

show switch spanning-tree mstpconfiguration { **global** | **instance-list** }
show switch spanning-tree mstpsummary { **instance-global-info** | **instance-interface-info 2** }

Syntax Description

mstp configuration	Displays the MST configuration identifier.
summary	Displays the spanning-tree summary.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.8.1	This command was introduced.

Usage Guidelines

This command only works when MST is enabled.

Example

The following is a sample output of the **show switch spanning-tree mstp configuration global** command:

```
nfvis# show switch spanning-tree mstp configuration global
spanning-tree mstp configuration global name transit-net
spanning-tree mstp configuration global revision 2
spanning-tree mstp configuration global max-hops 20
```

The following is a sample output of the **show switch spanning-tree mstp configuration instance-list** command:

```
nfvis# show switch spanning-tree mstp configuration instance-list
INSTANCE  VLANS MAPPED      STATE
------------------------------------
0         1,2350-2353,2363  enabled
1         15                enabled
```

show switch spanning-tree

To display the spanning-tree configuration, use the **show switch spanning-tree** command in privileged EXEC mode.

switch show spanning-tree [**bridge** | **interface** {**gigabitEthernet** | **port-channel**} *interface-id* | **root** | **summary**]

Syntax Description

bridge	Displays the bridge information.
interface	Specifies the interface type.
gigabitEthernet	Specifies Gigabit Ethernet as the interface type.
port-channel	Specifies port channel as the interface type.
interface-id	Specifies the interface ID.
root	Displays the bridge information.
summary	Displays the spanning-tree summary.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

None

Example

The following is a sample output of the **show switch spanning-tree** command

```
nfvis# show switch spanning-tree
spanning-tree summary admin-status enabled
spanning-tree summary Operation-mode RSTP
spanning-tree summary Port-Cost-Method long
spanning-tree summary Loopback-guard disabled
spanning-tree root Priority 32768
spanning-tree root Address 00:a6:ca:d6:38:50
spanning-tree root Cost 0
spanning-tree root Port 0
spanning-tree root Hello-Time 2
spanning-tree root Max-Age 20
spanning-tree root Forward-Delay 15
spanning-tree bridge Priority 32768
spanning-tree bridge Address 00:a6:ca:d6:38:50
spanning-tree bridge Hello-Time 2
spanning-tree bridge Max-Age 20
```

```
spanning-tree bridge Forward-Delay 15
       ADMIN    PRIO.           PORT               PORT        GUARD
PORT   STATE    NBR    COST     STATE     ROLE     FAST  TYPE  ROOT
-------------------------------------------------------------------------------
gi1/0  enabled  128.1  2000000  disabled  Disable  No    --    disabled
gi1/1  enabled  128.2  2000000  disabled  Disable  No    --    disabled
gi1/2  enabled  128.3  2000000  disabled  Disable  No    --    disabled
gi1/3  enabled  128.4  2000000  disabled  Disable  No    --    disabled
gi1/4  enabled  128.5  2000000  disabled  Disable  No    --    disabled
gi1/5  enabled  128.6  2000000  disabled  Disable  No    --    disabled
gi1/6  enabled  128.7  2000000  disabled  Disable  No    --    disabled
gi1/7  enabled  128.8  2000000  disabled  Disable  No    --    disabled

      ADMIN    PRIO.           PORT               PORT        GUARD
PORT  STATE    NBR       COST  STATE     ROLE     FAST  TYPE  ROOT
-------------------------------------------------------------------------------
1     enabled  128.1000  20000 disabled  Disable  No    --    disabled
2     enabled  128.1001  20000 disabled  Disable  No    --    disabled
3     enabled  128.1002  20000 disabled  Disable  No    --    disabled
4     enabled  128.1003  20000 disabled  Disable  No    --    disabled
```

Storm Control Commands

storm-control

To monitor incoming traffic levels and limit excessive flow of packets on any user facing switch port that could cause a traffic storm, use the **storm-control** command in switch configuration mode. To disable all traffic types, use the **no** form of this command.

storm-control { **unicast** | **multicast** | **broadcast** } { **level value** | **kbps value** }
no storm-control { **unicast** | **multicast** | **broadcast** } { **level value** | **kbps value** }

Syntax Description

level value	The range can be in terms of a percentage level from 1-100
kbps value	The Kbps value can range from 1-1000000

Command Default

None.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
4.1.1	This command was introduced.

Usage Guidelines

Storm control can act only on ingress traffic and not egress traffic.

If an interface configured with storm-control is part of the port-channel, storm-control is not active on the port-channel and only acts on the interface.

Storm control only drops traffic that is above the suppression level.

Example

The following is an example of storm control configuration:

```
nfvis(config-switch)# interface gigabitEthernet 1/0
nfvis(config-switch-if)# storm-control broadcast level 20
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

VLAN Commands

vlan

To create a VLAN, use the **vlan** command in switch configuration mode. Use the **no** form of the command to remove a VLAN.

Note To configure any parameter on the ENCS switch portal, ensure that you add or remove parameters using separate transactions on the CLI. For example, adding and removing multiple VLANs from the ENCS switch portal is not supported in the same CLI transaction. Add a VLAN first and then remove the VLAN in a separate transaction.

vlan [*vlan-id*] [**range** *vlan-range*]
no vlan *vlan-id*

Syntax Description

vlan-id	Specifies a VLAN ID. You can enter a value from one of the following ranges for the VLAN ID: • 1-2349 • 2450-4093
range *vlan-range*	Specifies a list of VLAN IDs. Separate nonconsecutive VLAN IDs with a comma and no spaces. Use a hyphen to designate a range of IDs.

Command Default

The default VLAN is VLAN 1.

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

If the VLAN does not exist, the VLAN is created. If the VLAN cannot be created, the command is finished with error and the current context is not changed.

Example

The following example shows how to create a VLAN:

```
nfvis(config)# switch
nfvis(config-switch)# vlan range 19-23
```

interface vlan

To enter the interface configuration (VLAN) mode for a specific VLAN or a range of VLANs, use the **interface vlan** command in the switch configuration mode. After this command is entered, all commands configure this VLAN or range of VLANs.

interface vlan {*vlan-id* | *vlan-range*}

Syntax Description

vlan-id	Specifies the VLAN ID. Valid range is: • 1–2349 • 2450–4093
vlan-range	Specifies a VLAN range. You can enter the range in the following formats: • 5–7 • 5,6,7 Values for the range can be between 1–2349 and 2450–4093.

Command Default

Not applicable

Command Modes

Switch configuration (config-switch)

Command History

Release	Modification
3.5.1	This command was introduced.

The following example shows how to configure a VLAN.

```
nfvis(config-switch)# interface vlan 1
```

name

To name a VLAN, use the **name** command in interface switch configuration mode.

name *string*

Syntax Description

string	Specifies a unique VLAN name. Length: 1 to 32 characters.

Command Default

None

Command Modes

Interface (VLAN) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example shows how to specify a unique VLAN name:

```
nfvis(config-switch)# interface vlan 1
nfvis(config-switch-if)# name testvlan
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

private-vlan

To configure a private VLAN, use the **private-vlan** command in interface switch configuration mode. Use the **no** form of the command to return the VLAN to normal VLAN configuration.

private-vlan {**association** *vlan-id* | **community** | **isolated** | **primary**}
no private-vlan

Syntax Description

association *vlan-id*	Associates the primary VLAN with secondary VLANs using the VLAN ID. Valid range is: • 1–2349 • 2450–4093
community	Designates the VLAN as a community VLAN.
isolated	Designates the VLAN as an isolated VLAN.
primary	Designates the VLAN as a primary VLAN.

Command Default

None

Command Modes

Interface (VLAN) switch configuration (config-switch-if)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

- The VLAN type cannot be changed if there is a private VLAN port that is a member in the VLAN.
- The VLAN type cannot be changed if it is associated with other private VLANs.
- The VLAN type is not kept as a property of the VLAN when the VLAN is deleted.

Example

The following example shows how to configure a private VLAN:

```
nfvis(config-switch)# interface vlan 1
nfvis(config-switch-if)# private-vlan primary
nfvis(config-switch-if)# commit
nfvis(config-switch-if)# end
```

show switch vlan

To display VLAN information, use the **show switch vlan** command in privileged EXEC mode.

show switch vlan [*vlan-id*] [**detailed** {**created-by** | **name** | **tagged-ports** | **untagged-ports** | **vlan**}]

Syntax Description

vlan-id	Specifies the VLAN ID.
created-by	Displays the information based on the creation mode.
name	Displays the information based on the name.
tagged-ports	Displays the information based on the tagged ports.
untagged-ports	Displays the information based on the untagged ports.
vlan	Displays the information based on the VLAN.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.6.1	This command was introduced.

Example

The following is a sample output of the **show switch vlan** command:

```
nfvis# show switch vlan
VLAN              TAGGED                          CREATED
ID    VLAN  NAME  PORTS   UNTAGGED PORTS          BY
-------------------------------------------------------------
1     1     1     None    gi0-7,te2,te4,po1-4    Default
400   400   400   te2     None                    Manual
```

Switch Show Commands

switch show arp

To display entries in the ARP table, use the **switch show arp** command in privileged EXEC mode.

switch show arp

Syntax Description

This command has no arguments.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

The Interface field can be empty because the associated interface of a MAC address can be aged out from the FDB table.

If an ARP entry is associated with an IP interface that is defined on a port or port channel, the VLAN field is empty.

Example

The following example displays entries in the ARP table:

```
nfvis# switch show arp

Total number of entries: 1

VLAN      Interface IP Address        HW Address          status
----------------------------------------------------------------------
VLAN2363  te1/2     169.254.1.1       00:3a:7d:31:42:3b   dynamic
```

switch show bridge multicast filtering

To display the multicast filtering configuration, use the **switch show bridge multicast filtering** command in privileged EXEC mode.

switch show bridge multicast filtering vlan *vlan-id*

Syntax Description

vlan *vlan-id*	Specifies the VLAN.

Command Default

Display multicast filtering configuration for all the VLANs.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example displays the Multicast configuration for VLAN 1.

```
nfvis# switch show bridge multicast filtering vlan 1

Filtering: Enabled
VLAN: 1
Forward-All

  Port    Static    Status
----------------------------------------
  gi0   -           Filter
  gi1   -           Filter
  gi2   -           Filter
  gi3   -           Filter
  gi4   -           Filter
  gi5   -           Filter
  gi6   -           Filter
  gi7   -           Filter
  te2   -           Filter
  te4   -           Filter
  po1   -           Filter
  po2   -           Filter
  po3   -           Filter
  po4   -           Filter
```

switch show bridge multicast unregistered

To display the unregistered Multicast filtering configuration, use the **switch show bridge multicast unregistered** command in privileged EXEC mode.

switch show bridge multicast unregistered

Syntax Description

No default argument or values

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example displays the unregistered Multicast configuration.

```
nfvis# switch show bridge multicast unregistered

    Port     Unregistered
------------------------------
   gi1/0       Forward
   gi1/1       Filter
   gi1/2       Forward
   gi1/3       Forward
   gi1/4       Forward
   gi1/5       Forward
   gi1/6       Forward
   gi1/7       Forward
```

switch show dot1x

Use the **switch show dot1x** command in privileged EXEC mode to do the following:

- Display the 802.1X interfaces or a specified interface status.
- Display information on all the ports (including not-present ports).
- Display 802.1x statistics.
- Display active 802.1X authorized users for the device.

Release 3.6.1 and Later Releases

switch show dot1x {**detailed** | **interface gigabitEthernet** *interface-id* | **statistics** | **users**}

Release 3.5.1

switch show dot1x {**all** | **detailed** | **interface gigabitEthernet** *interface-id* | **statistics** [**gigabitEthernet** *interface-id*] | **users**}

Syntax Description

all	Display by all dot1x. This parameter is available only in Release 3.5.1.
detailed	Displays information for non-present ports in addition to present ports.
interface gigabitEthernet *interface-id*	Displays the information for the specified interface ID.
statistics	Display 802.1x statistics.
users	Display active 802.1 authenticated users.

Command Default

If **detailed** parameter is used, information about all ports is displayed. If **users** parameter is used, information about all users is displayed.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.6.1	The command parameters are changed.
3.5.1	This command was introduced.

Example 1

The following example specifies that unregistered Multicast packets are filtered on the interface gigabitEthernet 1/1:

```
nfvis# switch show dot1x detailed
```

```
Authentication is enabled
Authentication Servers Radius
UNauthenticated VLANs:
Authentication failure traps are disabled
Authentication success traps are disabled


gi1/0
Host mode: multiple
Port Administrated Status: force-authorized
Guest VLAN: disabled
Open access: disabled
Server timeout: 30 sec
Port Operational Status: authorized*
* Port is down or not present
Reauthenticaion is enabled
Reauthentication period: 500
Quiet period: 120 sec
Interfaces 802.1X-Based Parameters
  Tx period: 60 sec
  supplicantTimeout: 3600 sec
  Max req: 6
Authentication success: 0
Authentication fails: 0

gi1/1
Host mode: multiple
Port Administrated Status: force-authorized
Guest VLAN: disabled
Open access: disabled
Server timeout: 30 sec
Port Operational Status: authorized*
* Port is down or not present
Reauthenticaion is disabled
Reauthentication period: 3600
Quiet period: 60 sec
Interfaces 802.1X-Based Parameters
  Tx period: 30 sec
  supplicantTimeout: 30 sec
  Max req: 2
Authentication success: 0
Authentication fails: 0

gi1/2
Host mode: multiple
Port Administrated Status: force-authorized
Guest VLAN: disabled
Open access: disabled
Server timeout: 30 sec
Port Operational Status: authorized*
* Port is down or not present
Reauthenticaion is disabled
Reauthentication period: 3600
Quiet period: 60 sec
Interfaces 802.1X-Based Parameters
  Tx period: 30 sec
  supplicantTimeout: 30 sec
  Max req: 2
Authentication success: 0
Authentication fails: 0
```

The following list describes the significant fields shown in the example:

- **Port**: The port interface-id.
- **Host mode**: The port authentication configured mode. Possible values: single-host, multi-host, multi-sessions.
- **Port Administrated status**: The port administration (configured) mode. Possible values: force-auth, force-unauth, auto.
- **Port Operational status**: The port operational (actual) mode. Possible values: authorized or unauthorized.
- **Quiet period**: Number of seconds the device remains in the quiet state following a failed authentication exchange (for example, the client provided an invalid password).
- **Tx period**: Number of seconds the device waits for a response to an Extensible Authentication Protocol (EAP) request/identity frame from the client before resending the request.
- **Supplicant timeout**: Number of seconds the device waits for a response to an EAP-request frame from the client before resending the request.
- **Max req**: Maximum number of times the device sends an EAP request frame (assuming that no response is received) to the client before restarting the authentication process.
- **Authentication success**: Number of times the state machine received a Success message from the Authentication Server.
- **Authentication fails**: Number of times the state machine received a Failure message from the Authentication Server.

Example 3

The following example displays 802.1X statistics for gigabitEthernet 1/1:

```
nfvis# switch show dot1x statistics gigabitEthernet 1/1
Interface: gi1/0
EapolFramesRx: 11
EapolFramesTx: 14
EapolStartFramesRx: 9
EapolLogoffFramesRx: 0
EapolRespIdFramesRx: 1
EapolRespFramesRx: 1
EapolReqIdFramesTx: 1
EapolReqFramesTx: 1
InvalidEapolFramesRx: 0
EapLengthErrorFramesRx: 0
LastEapolFrameVersion: 1
LastEapolFrameSource: 00:1f:26:66:d4:06
```

The following list describes the significant fields shown in the example:

- **EapolFramesRx**: Number of valid EAPOL frames of any type that have been received by this Authenticator.
- **EapolFramesTx**: Number of EAPOL frames of any type that have been transmitted by this Authenticator.

- **EapolStartFramesRx**: Number of EAPOL Start frames that have been received by this Authenticator.
- **EapolLogoffFramesRx**: Number of EAPOL Logoff frames that have been received by this Authenticator.
- **EapolRespIdFramesRx**: Number of EAP Resp/Id frames that have been received by this Authenticator.
- **EapolRespFramesRx**: Number of valid EAP Response frames (other than Resp/Id frames) that have been received by this Authenticator.
- **EapolReqIdFramesTx**: Number of EAP Req/Id frames that have been transmitted by this Authenticator.
- **EapolReqFramesTx**: Number of EAP Request frames (other than Req/Id frames) that have been transmitted by this Authenticator.
- **InvalidEapolFramesRx**: Number of EAPOL frames that have been received by this Authenticator for which the frame type is not recognized.
- **EapLengthErrorFramesRx**: Number of EAPOL frames that have been received by this Authenticator in which the Packet Body Length field is invalid.
- **LastEapolFrameVersion**: Protocol version number carried in the most recently received EAPOL frame.
- **LastEapolFrameSource**: Source MAC address carried in the most recently received EAPOL frame.

switch show lacp

To display LACP information for all interfaces or a specific interface, use the **switch show lacp** command in privileged EXEC mode.

switch show lacp [{**gigabitEthernet** | **port-channel**} *interface-id*]

Syntax Description

gigabitEthernet	Specifies Gigabit Ethernet as the interface type.
port-channel	Specifies port channel as the interface type.
interface-id	Specifies the interface ID.

Command Default

Displays LACP information for all interfaces.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.6.1	This command was introduced.

Example

The following is a sample output of the **switch show lacp** command for Gigabit Ethernet interface 1/0.

```
nfvis# switch show lacp gigabitEthernet 1/0

Port gi1/0 LACP parameters:
      Actor
              system priority:          1
              system mac addr:          00:a6:ca:d6:38:50
              port Admin key:           0
              port Oper key:            0
              port Oper number:         1
              port Admin priority:      1
              port Admin timeout:       LONG
              port Oper timeout:        LONG
              LACP Activity:            PASSIVE
              Aggregation:              AGGREGATABLE
              synchronization:          FALSE
              collecting:               FALSE
              distributing:             FALSE
              expired:                  FALSE
      Partner
              system priority:          0
              system mac addr:          00:00:00:00:00:00
              port Admin key:           0
              port Oper key:            0
              port Oper number:         0
              port Admin priority:      0
              port Oper priority:       0
              port Oper timeout:        LONG
              LACP Activity:            PASSIVE
```

```
Aggregation:              AGGREGATABLE
synchronization:          FALSE
collecting:               FALSE
distributing:             FALSE
expired:                  FALSE
```

switch show interface advertise

To display auto-negotiation advertisement information for all configured interfaces or for a specific interface, use the **switch show interface advertise** command in privileged EXEC mode.

switch show interface advertise [{**gigabitEthernet** | **port-channel**} *interface-id*]

Syntax Description

gigabitEthernet	Specifies Gigabit Ethernet as the interface type.
port-channel	Specifies port channel as the interface type.
interface-id	Specifies the interface ID.

Command Default

Displays information for all interfaces.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.6.1	The port-channel parameter is added.
3.5.1	This command was introduced.

Example

The following example displays auto-negotiation advertisement information for the interface gigabitEthernet 1/1:

```
nfvis# switch show interface advertise gigabitEthernet 1/1

Port: gi1/1
Type: 1G-Copper
Link state: Down
Auto negotiation: Enabled
Preference: Slave
```

switch show interface configuration

To display the configuration for all configured interfaces or a specific interface, use the **switch show interface configuration** command in privileged EXEC mode.

switch show interface configuration [{**gigabitEthernet** | **port-channel**} *interface-id*]

Syntax Description

gigabitEthernet	Specifies Gigabit Ethernet as the interface type.
port-channel	Specifies port channel as the interface type.
interface-id	Specifies the interface ID.

Command Default

Displays configuration for all interfaces.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.6.1	The port-channel parameter is added.
3.5.1	This command was introduced.

Example

The following example displays the configuration of all configured interfaces:

```
nfvis# switch show interface configuration
                                                    Flow     Admin    Mdix
Port     Type         Duplex   Speed    Neg       ctrl     State    Mode
-------------------------------------------------------------------------
gi1/0    1G-Copper    full     1000     Enabled   off      Up       auto
gi1/1    1G-Copper    full     1000     Enabled   off      Up       auto
gi1/2    1G-Copper    full     1000     Disabled  on       Up       auto
gi1/3    1G-Copper    full     1000     Enabled   off      Up       auto
gi1/4    1G-Copper    full     1000     Enabled   off      Up       auto
gi1/5    1G-Copper    full     1000     Enabled   off      Up       auto
gi1/6    1G-Copper    full     1000     Enabled   off      Up       auto
gi1/7    1G-Copper    full     1000     Enabled   off      Up       auto

                                         Flow     Admin
Ch       Type         Speed    Neg       ctrl     State
-------------------------------------------------------------------
po1      1G-Copper    --       Enabled  off       Up
po2      1G-Copper    --       Enabled  off       Up
po3      1G-Copper    --       Enabled  off       Up
po4      1G-Copper    --       Enabled  off       Up
```

switch show interface counters

To display traffic seen by all the physical interfaces or by a specific interface, use the **switch show interfaces counters** command in privileged EXEC mode.

switch show interface counters [{**gigabitEthernet** | **port-channel**} *interface-id*]

Syntax Description

gigabitEthernet	Specifies Gigabit Ethernet as the interface type.
port-channel	Specifies port channel as the interface type.
interface-id	Specifies the interface ID.

Command Default

Display counters for all interfaces.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.6.1	The port-channel parameter is added.
3.5.1	This command was introduced.

Example

The following example displays traffic seen by the Gigabit Ethernet interface 1/1:

```
nfvis# switch show interface counters gigabitEthernet 1/1

  Port        InUcastPkts    InMcastPkts    InBcastPkts    InOctets
-------------------------------------------------------------------
  gi1/1        0              0              0              0

  Port        OutUcastPkts   OutMcastPkts   OutBcastPkts   OutOctets
-------------------------------------------------------------------
  gi1/1        0              0              0              0
```

Table 4: switch show interface counters Field Description

Field	Description
InUcastPkts	Number of received Unicast packets.
InMcastPkts	Number of received Multicast packets.
InBcastPkts	Number of received broadcast packets.
InOctets	Number of received octets.
OutUcastPkts	Number of transmitted Unicast packets.
OutMcastPkts	Nmber of transmitted Multicast packets.

Field	Description
OutBcastPkts	Number of transmitted Broadcast packets.
OutOctets	Number of transmitted octets.

switch show interface description

To display the description of all configured interfaces or a specific interface, use the **switch show interface description** command in privileged EXEC mode.

switch show interface description [{**gigabitEthernet** | **port-channel**} *interface-id*]

Syntax Description

gigabitEthernet	Specifies Gigabit Ethernet as the interface type.
port-channel	Specifies port channel as the interface type.
interface-id	Specifies the interface ID.

Command Default

Displays description for all interfaces.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.6.1	The port-channel parameter is added.
3.5.1	This command was introduced.

Example

The following example displays the description for all configured interfaces:

```
nfvis# switch show interface description

Port        Description
--------------------
gi1/0       None
gi1/1       None
gi1/2       SW2
gi1/3       None
gi1/4       None
gi1/5       None
gi1/6       None
gi1/7       None

Ch          Description
--------------------
po1         None
po2         None
po3         None
po4         None
```

switch show interface protected-ports

To display information about all protected interfaces or a specific interface, use the **switch show interface protected-ports** command in privileged EXEC mode.

switch show interface protected-ports [{**gigabitEthernet** | **port-channel**} *interface-id*]

Syntax Description

gigabitEthernet	Specifies Gigabit Ethernet as the interface type.
port-channel	Specifies port channel as the interface type.
interface-id	Specifies the interface ID.

Command Default

Displays the information about all protected interfaces.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.6.1	The port-channel parameter is added.
3.5.1	This command was introduced.

Example

The following example displays the information about all protected interfaces:

```
nfvis# switch show interface protected-ports

Interface        State       Community
----------------------------------------
   gi1/0      Unprotected        Isolated
   gi1/1      Unprotected        Isolated
   gi1/2      Unprotected        Isolated
   gi1/3      Unprotected        Isolated
   gi1/4      Unprotected        Isolated
   gi1/5      Unprotected        Isolated
   gi1/6      Unprotected        Isolated
   gi1/7      Unprotected        Isolated
```

switch show interface port-channel

To display information about all port channel interfaces or a specific interface, use the **switch show interface port-channel** command in privileged EXEC mode.

switch show interface port-channel [*interface-id*]

Syntax Description

interface-id	(Optional) Specifies an interface ID.

Command Default

Displays information about all port channels.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.6.1	This command was introduced.

Example

The following example displays the port channels information:

```
nfvis# switch show interface port-channel
Channel       Ports
-----------------------
Load balancing: src-dst-mac

po1
po2
po3
po4
```

switch show interface status

To display the status of all interfaces or a specific interface, use the **switch show interface status** command in privileged EXEC mode.

switch show interface status [{**gigabitEthernet** | **port-channel**} *interface-id*]

Syntax Description

gigabitEthernet	Specifies Gigabit Ethernet as the interface type.
port-channel	Specifies port channel as the interface type.
interface-id	Specifies the interface ID.

Command Default

Displays status of all interfaces.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.6.1	The port-channel parameter is added.
3.5.1	This command was introduced.

Example

The following example displays the status of all interfaces:

```
nfvis# switch show interface status
                                                    Flow     Link     Mdix
Port     Type         Duplex   Speed    Neg      ctrl     State    Mode
--------------------------------------------------------------------------
gi1/0    1G-Copper    --       1000     --        off     Down     --
gi1/1    1G-Copper    --       1000     --        off     Down     --
gi1/2    1G-Copper    --       1000     --        off     Down     --
gi1/3    1G-Copper    --       1000     --        off     Down     --
gi1/4    1G-Copper    --       1000     --        off     Down     --
gi1/5    1G-Copper    --       1000     --        off     Down     --
gi1/6    1G-Copper    --       1000     --        off     Down     --
gi1/7    1G-Copper    --       1000     --        off     Down     --

                                                    Flow     Link
Ch       Type         Duplex   Speed    Neg      ctrl     State
--------------------------------------------------------------------------
po1      1G-Copper    --       --       --        off     Not Presence
po2      1G-Copper    --       --       --        off     Not Presence
po3      1G-Copper    --       --       --        off     Not Presence
po4      1G-Copper    --       --       --        off     Not Presence
```

switch show interface storm-control

To display the storm control configuration, use the **switch show interface storm-control** command in privileged EXEC mode.

switch show interface storm-control

Syntax Description

No default argument or values

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
4.1.1	This command was introduced.

Example

The following example displays storm control configuration:

```
nfvis# switch show interface storm-control

PORT    BROADCAST BROADCAST UNICAST    UNICAST MULTICAST    MULTICAST
    LEVEL       Kbps    LEVEL Kbps      LEVEL    Kbps

1/0   0  0  0  0  0  0
1/1   0  0  0  0  0  0
1/2   0  0  0  0  0  0
1/3   0  0  0  0  0  0
1/4   0  0  0  0  0  0
1/5   0  0  0  0  0  0
1/6   0  0  0  0  0  0
1/7   0  0  0  0  0  0
```

switch show interface switchPort

To display the switchport information of all interfaces or a specific interface, use the **switch show interface switchPort** command in privileged EXEC mode.

switch show interface switchPort [{**gigabitEthernet** | **port-channel**} *interface-id*]

Syntax Description

gigabitEthernet	Specifies Gigabit Ethernet as the interface type.
port-channel	Specifies port channel as the interface type.
interface-id	Specifies the interface ID.

Command Default

Displays switchport information of all interfaces.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following is a sample output of the **switch show interface switchPort** command that displays switchport information for Gigabit Interface 1/0:

```
nfvis# switch show interface switchport gigabitEthernet 1/0
Name: gi1/0
Switchport: enable
Administrative Mode: access
Operational Mode: Down
Access Mode VLAN: 1
Trunking Native Mode VLAN: 1
Trunking VLANs: 1-2349,2450-4093
General PVID: 1
General VLANs: none
General Egress Tagged VLANs: None
General Forbidden VLANs: None
General Ingress Filtering: disabled
General Acceptable Frame Type: all
General GVRP status: disabled
Customer Mode VLAN: none
Private-vlan promiscuous-association primary VLAN: none
Private-vlan promiscuous-association Secondary VLANs: none
Private-vlan host-association primary VLAN: none
Private-vlan host-association Secondary VLAN: none
```

switch show ip igmp snooping groups

To display the Multicast groups learned by IGMP snooping, use the **switch show ip igmp snooping groups** command in the privileged EXEC mode.

switch show ip igmp snooping groups [**vlan** *vlan-id*] [**ip-addr** *ip-address*]

Syntax Description

vlan *vlan-id*	(Optional) Specifies the VLAN.
ip-addr *ip-address*	(Optional) Specifies the IP address.

Command Default

No default behavior or values.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

To see all Multicast groups learned by IGMP snooping, use the **switch show ip igmp snooping groups** command without parameters. To see a subset of Multicast groups learned by IGMP snooping, use the **switch show ip igmp snooping groups command** with parameters.

Example

The following example shows a sample output for the command:

```
nfvis# switch show ip igmp snooping groups
Vlan         Group            Source     Include Ports   Exclude Ports   Comp.
             Address          Address                                    Mode.
-------------------------------------------------------------------------------
1           239.255.255.250   *          gi1/0/1                        v2
```

switch show ip igmp snooping interface

To display the IGMP snooping configuration for a specific VLAN, use the **switch show ip igmp snooping interface** command in the privileged EXEC mode.

switch show ip igmp snooping interface [*vlan-id*]

Syntax Description

vlan-id	(Optional) Specifies the VLAN.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example displays the IGMP snooping configuration for VLAN 20:

```
nfvis# switch show ip igmp snooping interface 20

IGMP Snooping is globally enabled
IGMP Snooping Querier is globally disabled
VLAN  20
  IGMP Snooping is  disabled
  IGMP snooping last immediate leave: disabled
  Automatic learning of Multicast router ports is enabled
  IGMP Snooping Querier is disabled
  IGMP Snooping Querier operation state: is not running
  IGMP Snooping Querier version: 2
  IGMP Snooping Querier election is enabled
  IGMP Snooping Querier address :  255.255.255.255
  IGMP snooping robustness:  admin 2 oper 2
  IGMP snooping query interval:  admin 125 sec oper 125 sec
  IGMP snooping query maximum response:  admin 10 sec oper 10 sec
  IGMP snooping last member query counter:  admin 0 oper 2
  IGMP snooping last member query interval:  admin 1000 msec oper 1000 msec

Groups that are in IGMP version 2 compatibility mode:
Groups that are in IGMP version 1 compatibility mode:
```

switch show ip igmp snooping mrouter

To display information on dynamically learned Multicast router interfaces for all VLANs or for a specific VLAN, use the **switch show ip igmp snooping mrouter** command in privileged EXEC mode.

switch show ip igmp snooping mrouter [**interface** *vlan-id*]

Syntax Description

interface *vlan-id*	(Optional) Specifies the VLAN.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example displays information on dynamically learned Multicast router interfaces for VLAN 1:

```
nfvis# switch show ip igmp snooping mrouter interface 1
Vlan         Dynamic      Static       Forbidden
-------------------------------------------------
  1           None         None         gi1
```

switch show ip interface

To display the usability status of configured IP interfaces, use the **switch show ip interface** command in privileged EXEC mode.

switch show ip interface

Syntax Description

This command has no arguments.

Command Default

All IP addresses.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example displays all configured IP addresses and their types:

```
nfvis# switch show ip interface

IP Address        I/F        I/F Status   Type     Directed   Prec  Redirect Status
                             admin/oper            Broadcast
-------------------------------------------------------------------------------
169.254.1.0       VLAN2363   Up/Up        Static   disable    No    enable   enable
```

switch show ip route

To display the current state of the routing table, use the **switch show ip route** command in the privileged EXEC mode.

switch show ip route

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example shows a sample output from the **switch show ip route** command when IP routing is enabled:

```
nfvis# switch show ip route

Maximum Parallel Paths: 1 (1 after reset)
IP Forwarding: enabled

Codes: > - best, C - connected, S - static

C   169.254.0.0/16 is directly connected, VLAN2363
```

switch show mac address-table

To display entries in the MAC address table, use the **switch show mac address-table** command in privileged EXEC mode.

switch show mac address-table {**count** | **dynamic** | **static** | **using**} [{**vlan** *vlan-id* | **gigabitEthernet** *interface-id* | **port-channel** *interface-id* | **address** *mac-address*}]

Syntax Description

count	Displays the number of addresses present in the Forwarding database.
dynamic	Displays dynamic address.
static	Displays static addresses.
using	Displays entries using specific interface or MAC address.
vlan *vlan-id*	(Optional) Displays entries for a specific VLAN.
gigabitEthernet *interface-id*	(Optional) Displays entries for a specific Gigabit Ethernet interface.
port-channel *interface-id*	(Optional) Displays entries for a specific port channel.
address *mac-address*	(Optional) Displays entries for a specific MAC address.

Command Default

If no parameters are entered, the entire table is displayed.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

Internal usage VLANs (VLANs that are automatically allocated on routed ports) are presented in the VLAN column by a port number and not by a VLAN ID.

Example 1

```
nfvis# switch show mac address-table using vlan 1

     Vlan     Mac Address              Port        Type
------------------------------------------------------------
     1        00:3a:7d:31:42:ac        none        n/a
```

Example 2

```
nfvis# switch show mac address-table count

Capacity : 8192
Free     : 8190
Used     : 2
Secure   : 0
Dynamic  : 1
```

```
Static   : 0
Internal : 1
```

switch show power-inline

To display inline power information, use the **switch show power-inline** command in privileged EXEC mode.

switch show power-inline

Syntax Description

This command has no arguments.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following is a sample output of the **switch show power-inline** command:

```
nfvis# switch show power-inline
Power-limit mode: Class based
Nominal Power (W): 200
Consumed Power (W): 0

Interface: gi1/0
Admin state: auto
Operational stat: Searching
Power (W): 0.0
Class: 0
Device: None
Priority: low
Port standard: 60W PoE
Admin power limit (W): 30.0
Operational power limit (W): 30.0
Spare pair: Disabled
Negotiated power (W): 0.0
Current (mA): 0
Voltage (V): 0.0
Overload Counter: 0
Short Counter: 0
Denied Counter: 0
Absent Counter: 0
Invalid Signature Counter: 0

Interface: gi1/1
Admin state: auto
Operational stat: Searching
Power (W): 0.0
Class: 0
Device: None
Priority: low
Port standard: 60W PoE
Admin power limit (W): 30.0
Operational power limit (W): 30.0
```

```
Spare pair: Disabled
Negotiated power (W): 0.0
Current (mA): 0
Voltage (V): 0.0
Overload Counter: 0
Short Counter: 0
Denied Counter: 0
Absent Counter: 0
Invalid Signature Counter: 0

Interface: gi1/2
Admin state: auto
Operational stat: Searching
Power (W): 0.0
Class: 0
Device: None
Priority: low
Port standard: 60W PoE
Admin power limit (W): 30.0
Operational power limit (W): 30.0
Spare pair: Disabled
Negotiated power (W): 0.0
Current (mA): 0
Voltage (V): 0.0
Overload Counter: 0
Short Counter: 0
Denied Counter: 0
Absent Counter: 0
Invalid Signature Counter: 0

Interface: gi1/3
Admin state: auto
Operational stat: Searching
Power (W): 0.0
Class: 0
Device: None
Priority: low
Port standard: 60W PoE
Admin power limit (W): 30.0
Operational power limit (W): 30.0
Spare pair: Disabled
Negotiated power (W): 0.0
Current (mA): 0
Voltage (V): 0.0
Overload Counter: 0
Short Counter: 0
Denied Counter: 0
Absent Counter: 0
Invalid Signature Counter: 0

Interface: gi1/4
Admin state: auto
Operational stat: Searching
Power (W): 0.0
Class: 0
Device: None
Priority: low
Port standard: 60W PoE
Admin power limit (W): 30.0
Operational power limit (W): 30.0
Spare pair: Disabled
Negotiated power (W): 0.0
Current (mA): 0
Voltage (V): 0.0
```

```
Overload Counter: 0
Short Counter: 0
Denied Counter: 0
Absent Counter: 0
Invalid Signature Counter: 0

Interface: gi1/5
Admin state: auto
Operational stat: Searching
Power (W): 0.0
Class: 0
Device: None
Priority: low
Port standard: 60W PoE
Admin power limit (W): 30.0
Operational power limit (W): 30.0
Spare pair: Disabled
Negotiated power (W): 0.0
Current (mA): 0
Voltage (V): 0.0
Overload Counter: 0
Short Counter: 0
Denied Counter: 0
Absent Counter: 0
Invalid Signature Counter: 0

Interface: gi1/6
Admin state: auto
Operational stat: Searching
Power (W): 0.0
Class: 0
Device: None
Priority: low
Port standard: 60W PoE
Admin power limit (W): 30.0
Operational power limit (W): 30.0
Spare pair: Disabled
Negotiated power (W): 0.0
Current (mA): 0
Voltage (V): 0.0
Overload Counter: 0
Short Counter: 0
Denied Counter: 0
Absent Counter: 0
Invalid Signature Counter: 0

Interface: gi1/7
Admin state: auto
Operational stat: Searching
Power (W): 0.0
Class: 0
Device: None
Priority: low
Port standard: 60W PoE
Admin power limit (W): 30.0
Operational power limit (W): 30.0
Spare pair: Disabled
Negotiated power (W): 0.0
Current (mA): 0
Voltage (V): 0.0
Overload Counter: 0
Short Counter: 0
Denied Counter: 0
Absent Counter: 0
```

```
Invalid Signature Counter: 0
```

switch show radius-server configuration

To display the RADIUS server settings, use the **switch show radius-server configuration** command in privileged EXEC mode.

switch show radius-server configuration

Syntax Description

This command has no arguments.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example displays RADIUS server settings:

```
nfvis# switch show radius-server configuration

IP address  Port   port    Time-      Ret-    Dead-     Prio.    Usage
            Auth   Acct    Out        rans    Time
-------------------------------------------------------------------------

Global values
-------------
TimeOut : 3
Retransmit : 3
Deadtime : 0
Source IPv4 interface : none
Source IPv6 interface : none
```

switch show radius-server key

To display the RADIUS server key settings, use the **switch show radius-servers key** command in privileged EXEC mode.

switch show radius-server key

Syntax Description

This command has no arguments.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Example

The following example displays RADIUS server key settings:

```
nfvis# switch show radius-server key

   IP address        key
----------------------------------------
   172.16.1.1        Sharon123
   172.16.1.2        Bruce123

   Global key
----------------------------------------
   Alice456
```

switch show rmon statistics

To display RMON statistics, use the **switch show rmon statistics** command in privileged EXEC mode.

switch show rmon statistics {**gigabitEthernet** | **port-channel**} *interface-id*

Syntax Description

gigabitEthernet	Specifies Gigabit Ethernet as the interface type.
port-channel	Specifies port channel as the interface type.
interface-id	Specifies the interface ID.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.6.1	The port-channel parameter is added.
3.5.1	This command was introduced.

Example

The following example displays RMON statistics for the interface gigabitEthernet 1/1

```
nfvis# switch show rmon statistics gigabitEthernet 1/1

Port                gi1/1

Dropped:            0
Octets:             0               Packets:            0
Broadcast:          0               Multicast:          0
CRC Align Errors:   0               Collisions:         0
Undersize Pkts:     0               Oversize Pkts:      0
Fragments:          0               Jabbers:            0
64 Octets:          0               65 to 127 Octets:   0
128 to 255 Octets:  0               256 to 511 Octets:  0
512 to 1023 Octets: 0               1024 to max Octets: 0
```

switch show spanning-tree

To display the spanning-tree configuration, use the **switch show spanning-tree** command in privileged EXEC mode.

switch show spanning-tree {**summary** | **bpdu** {**detail** | **interface** [{**gigabitEthernet** | **port-channel**} *interface-id*]}}

Syntax Description

summary	Displays summarized information.
bpdu	Displays Bridge Protocol Data Unit (BPDU) information.
detail	Displays detailed BPDU information.
interface	Specifies the interface type for BPDU information.
gigabitEthernet	Specifies Gigabit Ethernet as the interface type.
port-channel	Specifies port channel as the interface type.
interface-id	Specifies the interface ID for BPDU information.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Usage Guidelines

This command work only when Multiple STP mode is enabled.

Example 1

```
nfvis# switch show spanning-tree bpdu interface
Global: Flooding

 Interface    Admin Mode   Oper Mode
------------------------------------
   gi1/0       Global       STP
   gi1/1       Global      Guard
   gi1/2       Global       STP
   gi1/3       Global       STP
   gi1/4       Global       STP
   gi1/5       Global       STP
   gi1/6       Global       STP
   gi1/7       Global       STP
    po1        Global       STP
    po2        Global       STP
    po3        Global       STP
    po4        Global       STP
```

Example 2

```
nfvis# switch show spanning-tree summary

Spanning tree enabled mode stpCompatible
Default port cost method: long
Loopback guard: disabled


   Root ID    Priority  12288
              Address     00:3a:7d:31:42:ac
              Cost        0
              Port        0
              Hello Time 2 sec  Max Age 20 sec   Forward Delay 25 sec

   Bridge ID  Priority  12288
              Address     00:3a:7d:31:42:ac
              Hello Time 2 sec  Max Age 20 sec   Forward Delay 25 sec

   Number of topology changes 0 last change occurred 12 08:27 ago
   Times: hold 0, topology change 0, notification 0
          hello 2, max age 20, forward delay 25

Interfaces
   Name    State    Prio.Nbr     Cost     Status    Role      PortFast Type  Guard Root
-------------------------------------------------------------------------------------
   gi1/0  enabled    128.1     2000000   disabled    Disable      No    --    disabled
   gi1/1  enabled     96.2      35000    disabled    Disable     Yes    --    enabled
   gi1/2  enabled    128.3     2000000   disabled    Disable      No    --    disabled
   gi1/3  enabled    128.4     2000000   disabled    Disable      No    --    disabled
   gi1/4  enabled    128.5     2000000   disabled    Disable      No    --    disabled
   gi1/5  enabled    128.6     2000000   disabled    Disable      No    --    disabled
   gi1/6  enabled    128.7     2000000   disabled    Disable      No    --    disabled
   gi1/7  enabled    128.8     2000000   disabled    Disable      No    --    disabled
```

switch show vlan

To display VLAN information, use the **switch show vlan** command in privileged EXEC mode.

switch show vlan {**all** | **tag** *vlan-id* | **name** *vlan-name* | **private-vlan** [**tag** *vlan-id*]}

Syntax Description

all	Displays information about all VLANs.
tag *vlan-id*	Displays information for specified VLAN tag.
name *vlan-name*	Displays information for specified VLAN name. Valid length is from 1–32 characters.
private-vlan tag *vlan-id*	Displays information for private VLAN. In *vlan-id* parameter, specify the primary VLAN that represents the private VLAN to be displayed.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
3.5.1	This command was introduced.

Example 1

The following example provides information about all VLANs.

```
nfvis# switch show vlan all
Created by: D-Default, S-Static, G-GVRP, R-Radius Assigned VLAN, V-Voice VLAN

    Vlan        Name    Tagged Ports        UnTagged Ports      Created by
-------------------------------------------------------------------------------
     1           1                          gi1/0-7,te1/2,te1/4,po1-4      D
     20          20     te1/2                                       S
    2350        2350    te1/1              te1/3                    S
    2351        2351    te1/1              te1/3                    S
    2352        2352                                                S
    2353        2353                                                S
    2363        2363    te1/2                                       S
```

Example 2

The following example provides information about VLAN 20.

```
nfvis# switch show vlan name 20

Created by: D-Default, S-Static, G-GVRP, R-Radius Assigned VLAN, V-Voice VLAN

    Vlan        Name    Tagged Ports        UnTagged Ports      Created by
-------------------------------------------------------------------------------
     20          20     te1/2                                       S
```

Example 3

The following example provides information about private VLAN.

```
nfvis# switch show vlan private-vlan

Primary     Secondary    Type       Ports
------------------------------------------------
     20           1        primary     gi1/0
     10           5        isolated    gi1/1
```